

Accounts
Software
10 Packages comparedPersonal
Computer
World

Personal Computer World

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VNU Business Publications

WIN an NEC notebook,
 Nikon scanner,
 Smartsuite 96 p262

120 MHz Pentium group test • Six-speed CD-ROM drives • Beer and wine guides on CD-ROM • Sound card add-ons
 Accounts software: 10 packages compared • Windows 95 utilities • HP's Omnigo • Pagemaker 6.0

120MHz Pentiums

FROM
£1,886

HP's OmniGo
 page 60



Six-speed
 CDs



Faster and
 affordable

Crystal ball
 gazers

What 1996 holds

Booze bonanza

CD guides to beer
 and wine

Windows 95 utilities

IF YOUR CD-ROM
 AND 3.5" DISK
 ARE MISSING
 ASK YOUR
 NEWSAGENT



Pagemaker 6.0
 with HTML support

ALL HARDWARE TESTED
BY THE VNU LABS

DOUBLE DISK PACK FREE Trial - Exclusive on CD-ROM
 GO COMPUERVE! THE ONLINE TOUR

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As hardware prices fall and Pentium power increases, high-performance PCs are more affordable than ever before. *PCW* compares 16 120MHz Pentiums to find the one worthy of our Editor's Choice.

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Cover Disk or CD-ROM

● **Cover Disk** 8
3D Cyberpuck — excellent smooth scrolling action.

● **PCW Interactive CD-ROM** 9
650Mb of programs, music and animation including CompuServe's WinCIM 2.0 with Internet access. (CD-ROM Notes continue on page 167.)

Group Tests



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Accounting Software

● Still relatively shrouded in mystery, accountancy software is a serious business for those who use it. David Carter puts the big players head to head, and explains how knowing the drill can save time and money.



Features



Beer and wine guides

by PAUL BEGG

Get into the Christmas spirit as *PCW* rounds up and reviews the latest PC wine, beer and cocktail guides. As a cautionary measure, we also look at some hangover cures for the morning after.

9 8

Crystal gazing

1 4 4

by THE PCW TEAM

We take on Mystic Meg with our own predictions for the new year. And, we look back at the news and events of 1995.



Six-speed CDs

by GORDON LAING

They just keep getting faster and cheaper. *PCW* takes the latest six-speed CD drives for a spin and looks at the first eight-speed model, which is almost as fast as a hard disk.



1 5 0



Sound card add-ons

by STEVEN HELSTRIP

If your old FM sound card is out of tune with your needs, a General MIDI daughterboard could be the answer.

1 5 6

SoftWindows 2.0

by GEORGE COLE

If you want to use a Mac but need to run Windows programs, Insignia's SoftWindows is often the best solution. The new PowerMac-only version 2.0 claims to deliver full 486 performance.

1 7 0

Windows 95 utilities

by TIM PHILLIPS

Windows 95 is a great improvement on 3.1, but there's still plenty of room for improvement. *PCW* checks out the first batch of utilities designed to fill the gaps.

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Delphi Tutorial: Part 3

by TIM ANDERSON

Part three of our Delphi programming tutorial explains all about menus and dialogs.

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Have the best-looking labels in town.

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All-in-one scanning, OCR, storage and retrieval application.

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A complete road map of the USA on a single CD.

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A high-quality dedicated 35mm film scanner.

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Speakers to improve any PC sound system.

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A notebook-style flat display for your desktop PC.

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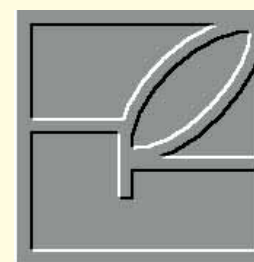
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Screenplay: Phantasmagoria

Screenplay: Magic Carpet 2

Focus: On-line gaming

CD-ROMs: Robert Mapplethorpe



PCW Cover Disk

This month we amaze you with
Cyberpuck, a rollicking and ravishing
3D action game with a twist.
David Price explains.

Installing and running the PCW Cover Disk

To install the programs, insert the disk in drive A: or B:, and from Windows run the file PCW.EXE in the root directory of that drive. All of the program will then be installed onto your PC and a Windows Program Manager icon will be created with which you can run the game.

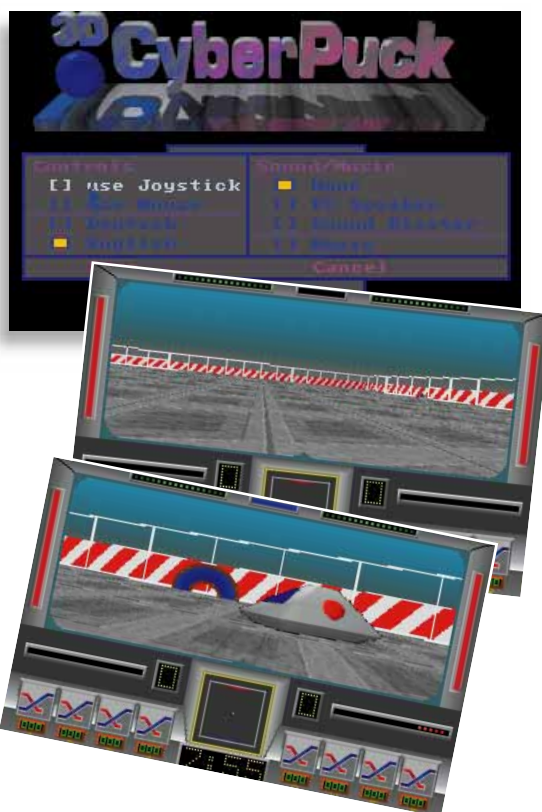
However, please remember that not all Windows setups run DOS games very well so if you have problems with Cyberpuck you are recommended to exit to DOS and run it from there. In addition, the game requires at least 570Kb of DOS memory to run. If you have less it will inform you, and then exit. In which case you could try running MEMMAKER (if you have DOS 6) to increase your low DOS memory, or REM out some lesser-needed lines from your AUTOEXEC.BAT and CONFIG.SYS files. Alternatively, you could create a boot disk by formatting a floppy disk allowing for system tracks and then typing:

SYS A: (or B: if your floppy is in drive B:)

You can then reboot your PC with this disk in the drive to obtain the maximum low DOS memory. See your DOS manual for further details.

Cyberpuck is designed to challenge even the quickest reactions and is guaranteed to quicken your pulse rate. You find yourself in a futuristic games court revving the engine on your sports buggy when suddenly the puck drops into the court and all hell breaks loose.

You must out-pace your opponent who tries to wrestle the puck from you before you get a chance to blast their goal...



*Try your puck against a worthy adversary,
in this futuristic action game with a twist*

IMPORTANT

If you have problems with the Cover Disk such as receiving a "Cannot read from drive A", error, please return the disk to the duplicator: TIB plc (PCW), TIB House, 11 Edward Street, Bradford BD4 7BH (who may be contacted on 01274 736990) together with a stamped addressed envelope and two 25p stamps. Where it is a duplication fault, the postage will be returned along with a replacement disk.

If your problem is not due to a faulty disk, and a phone number is shown for the publisher of the program in question, then it will probably be quicker for you to call them first as they will be able to provide direct assistance on their own programs faster than might otherwise be possible.

Alternatively, ring our Cover Disk hotline on weekdays between 10.30am and 4.30pm on 0891 715929. Calls are charged at 39p per minute cheap rate and 49p at all other times.

The PCW cover disk is virus checked at every stage of production. However, PCW will not accept liability for any problems arising from the use of the disk. Installing or running any of the programs on the disk indicates your agreement to this condition.

You are advised not to install any software on a networked PC before checking the disk. While PCW maintains a high standard of quality control, disks may be damaged in transportation. Check the disk's shutter before inserting it in the drive by sliding it to the left and allowing it to spring back.



PCW

Interactive CD-ROM

David Price introduces this month's CD-ROM, crammed with useful and entertaining features. The Microsoft CD Expo contains over 400Mb of Bill Gates' finest. And there's a CompuServe freebie bonanza, plus utilities, applications, drivers and a whole lot more!

[Minimum requirements: 4Mb free RAM (some can be in a permanent swapfile), 386SX/33 processor, Windows 3.1. Users with less than this should be able to run all the DOS programs on the CD-ROM directly from DOS or Windows (rather than using the front-end). For best performance we recommend: 8Mb installed RAM, 486 DX/50 processor, Windows 3.11 or Windows 95]

CORRECTION

The demo of Anagram Genius on last month's CD was mistakenly categorised as shareware. We would like to make it clear that this product is not shareware but normal commercial software published by Genius 2000 Software. Tel 0151 356 8000

PCW INTERACTIVE: Entire Contents List

AUDIO

Complementing the magazine sound board add-ons review in this issue, listen in to tracks 2-7. But don't play track 1 unless you want your PC or HI-FI to throw itself screaming onto the floor!

DOS PROGRAMS

Alice in Wonderland — Enthralling and educational

Astrological database — Transform yourself into Mystic Meg

Diskcopy — Multi-featured, useful utility

Easybase — Superb DOS database application

Easyword — Excellent DOS word processor

Galaxy — One of the most powerful shareware WPs available

Hexen — The Doom creators bring you an excellent new game

You're Hired — Job interview test simulator

EXTRAS

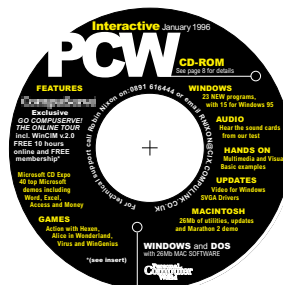
Super VGA Graphics Drivers (not for Windows 95)

Video for Windows Version 1.1e (Not for Windows 95)

FEATURES

MICROSOFT CD EXPO: 40 of Microsoft's top demos with many trial versions too

JANUARY 1996



XBOARD — Another handy Windows 3.1 program
Visual Basic Hands On — More source code from the popular column

WINDOWS 95 PROGRAMS

Animation Edit — Create your own animations the easy way

Bombsquad 2 — Fiendish brain basher of logic and deduction

FLO' — Warp and manipulate images to your heart's content

Image Edit — Make your own icons and images
Michael's Disk Benchmark — Analyse your disk drives

Micro Angelo — Ultimate Windows 95 icon handling

Print Screen — Stylish and instant screen grabber
Programmer's File Editor — Top hole program file editor

COMPUSERVE INFORMATION MANAGER:

Get online to CompuServe and the Internet for gratis, courtesy of CompuServe

MACINTOSH

Last month we saved up our Mac software to get you off to a good start in '96 with this cornucopia of purest joy, including a demo of Marathon 2; the Doom-basher for the Mac



MAGAZINE

Multimedia Hands On — Great 3D animations

Sounds — Stimulate your earholes

IFA301 — Makes using Windows 3.1 easier

Solitary Confinement — Time flies with these new solitaire programs

Stopwatch — Tantalising timekeeping utility

Toilet — Customise your recycle bin in a water closet style

Powertoys — Win95 add-ons that are highly recommended

Restart — Does all this and more, in accelerated time

Tab 95 — Mac OS users will turn green with envy at this new pop-up folder system for PCs

Taskview — Gives you new power with active tasking

WINDOWS 3.X PROGRAMS

A&B — Award-winning personal information manager

Auto CD — An unmissable autoplay program for your CDs

Button Star 5 — A desktop manager that ensures you won't miss business appointments

Design a room — Puts expensive interior designers on the dole

Disk Factory — One of the best shareware disk copiers

Time and Chaos — Personal info manager

Virus — Catch the bug with this addictive game

Win Genius — Try and win through in this draughts challenge

To run PCW Interactive (PCWI) use either File Manager to select your CD-ROM drive and run the file PCWI.EXE in the root directory of the CD-ROM. Or, if you are using Windows 95, just insert the CD into your CD-ROM

drive and wait for the program to load!

Throughout PCW Interactive you'll have the opportunity to run or install

**CONTINUES
ON PAGE 167**



programs, get further details on a particular program, try out demonstrations of programs, play videos, listen to audio file and much more. When any of these options is available an icon will be displayed indicating the fact. All you need to do is click once on it to activate the choice.

About this month's CD-ROM

A new year cometh and a new look interface for PCWI stumbles out blinking into the light. We just can't resist giving you the best CD-ROMs in the business; our new look has been inspired by the success of Windows 95.

Staying with a Microsoft theme we include this month, Microsoft's CD Expo. This is so comprehensive that we have given you the opportunity to run it from within PCWI or to leap into it from the root directory. Just run MICROSOFT.EXE. Similarly the CompuServe access software and internet connection kit can be accessed directly by selecting CSERVER.EXE.

MAIN FEATURES

Microsoft CD Expo

Bill Gates' boys and girls have led the market for years with the products you just can't afford to do without. Now we bring you Uncle Bill's collection of his latest and greatest software demos and trial versions.

CompuServe Goodies

Not a selection of Tim Brooke-Taylor style comedy sketches, but a demo of CompuServe's latest package, plus ten hours' free online time! Become one of CompuServe's four million satisfied customers and gain complete internet access via the worldwide web — and why not



A new look front screen for PCWI

take a CompuServe tour while you're at it? For further details refer to the card which has been included in this month's cover disc wallet.

Mac Software

We've pulled out all the stops for Mac aficionados this month and crammed in games, demos and utilities that will leave you breathless. Gorge yourself on our veritable banquet, including the Marathon 2 demo as the main course (it's the Mac's excellent answer to Doom): verily a big Mac extra value meal.

Video for Windows Enhanced Setup

If you select the "New users start here" button, on the first page of PCW Interactive you'll have the opportunity to install the latest version of the Video for Windows runtime, so that you can view the digital movies on the CD. If you haven't installed Video for Windows from a PCW Interactive CD before, then you

should install this new version, as it contains the latest drivers which deliver higher quality, a larger size and a faster playback rate. If you don't install the new version, some videos will display the message "Cannot display this video", or give similar warnings.

There are also some extra buttons on the Video for Windows page, which allow you to fine-tune your PC's performance without having to leave PCW Interactive or restart Windows. In particular, you can choose to have digital movies played back on your PC at full screen resolution! That's right, without having recourse to hardware add-ons such as MPEG cards, you can have full-screen digital videos when you run the PCW Interactive CD-ROM.

But please remember that when you exit from PCW Interactive, if you leave the option for full-screen video selected, then video in other applications will also be full screen. If you don't want this, re-run PCW Interactive, select the "Windowed" option and quit again.

Testing your CD-ROM

If you suspect your CD-ROM may actually be faulty or damaged you can run the file CDTEST.EXE in the SYSTEM directory of the CD-ROM. The program will then examine every byte of data in the PC partition of the disc to see if it can be correctly read. The process takes up to 35 minutes and generates a verification code if the disc passes the test. If the CD-ROM fails this test, try cleaning it with a light solution of washing up liquid and dry it with a lint free cloth and run the test again. If it still fails, return your CD-ROM to the magazine for a free replacement.

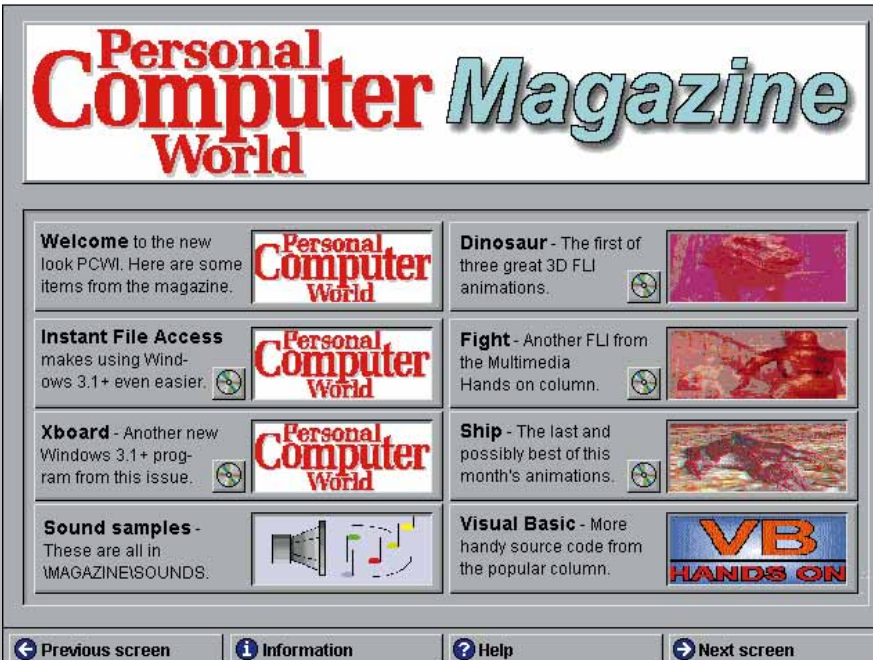
You are free to copy the CDTEST.EXE



Demos and trial versions of Microsoft software products



CD-ROM



Above A new look interface for PCW Interactive

Left PCWI brings you the World of Windows 95, with a whole host of software demos and trial versions of programmes

program to your hard disk in order to test other CD-ROMs, as long as it is not distributed in any way. If you are running CDTEST from your hard drive you need to specify the CD-ROM drive to test, as follows:

CDTEST D:

Note: We offer this tool "As is" purely as an aid to diagnosing possible faults, some of which may occur because an older version of MSCDEX.EXE is in use and not because of a faulty CD-ROM, and disclaim any responsibility for any erroneous error reports that it may generate.

IMPORTANT — READ THIS!

• General Protection Faults

If you receive general protection faults when running PCWI, or playing any digital videos it is probably because your graphic display driver may not be entirely 100 percent Microsoft compatible. The answer is therefore to install one of Microsoft's own drivers, as follows, (but

NOT if you are using Windows 95, as the drivers supplied with it are even newer than the ones on this disc):

- 1) Run "Windows Setup" from File Manager, then select, "Options" followed by "Change System Settings".

- 2) Scroll through the list of displayed graphic drivers until you get to the final entry "Other Display (Requires Disk from OEM)", and select it.

- 3) Insert this month's CD-ROM into the drive and replace the "A:\ prompt with "D:\SYSTEM\SVGA256" (changing the D: to the correct letter if your CD-ROM is not in drive D:), then press Return.

- 4) Scroll through the new drivers until you find the ones beginning "Super VGA..." and select the one for the resolution you prefer to use. The driver will then be installed and Windows restarted. PCWI and Video for Windows should then have no further problems.

If this works (which it should in 95 percent of cases), you may wish to contact the supplier of your graphics card to see

if they have an updated graphics driver. If Microsoft's drivers don't work you will need to contact your graphics card supplier anyway.

• Video for Windows install fails

If the Video for Windows installation fails and you receive an error such as "XXXXXXXX.YYY cannot be updated as it is a shared file", the answer is to delete the file "XXXXXXXX.YYY" (or whatever it is called) and reinstall Video for Windows.

• PCWI is slow to load or runs slowly

You need at least 4Mb of RAM free to use PCWI. If necessary you can obtain this by creating a permanent swap file of up to 4Mb. You are also advised to enable read caching of your CD-ROM by adding its name to the SMARTDRV line in your AUTOEXEC.BAT file. You should also allow MSCDEX to set up its own buffers by adding a line such as /M:10 to the MSCDEX line, also in your AUTOEXEC.BAT file. Please refer to your manuals for full details.

• Windows NT and OS/2

Unfortunately Macromedia Director, the program used to create PCWI, is incompatible with Windows NT. However, you should be able to run PCWI from OS/2 by simply calling up PCWI.EXE from the command line.



CD-ROM Advice & Contacts

The **PCW CD-ROM** is virus checked at every stage of production. However, PCW will not accept liability for any problems arising from its use. You are advised not to install software on a networked PC before checking the disc.

For technical support on the CD-ROM and the programs on it call the VNU 24-hour Hotline on 0891 616 444. This is a computerised touch-tone advice system providing hints and tips on a wide range of topics. It also offers you the opportunity to speak to a member of our technical support staff during office hours by pressing the "0" key on your keypad. Calls cost 39p min off-peak and 49p at all other times (tone phones only).

Using the computerised system, you can access the information you need very quickly. If you ask to speak to a member of our technical support staff and we cannot answer your question immediately, we will offer to call you back at our expense. Outside office hours you can leave us a message by pressing the "9" key. If you leave your phone number, we'll call you back at the earliest opportunity during office hours.

If you prefer you can email rnixon@cix.compulink.co.uk, or CompuServe: 70007,5547, or write to us at the magazine.

Personal Computer World



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Editorial

Five years ago WordPerfect was the world's biggest selling word processor. It was unthinkable then that by 1995 the product would be finished, yet that is what is happening. Novell has decided to sell it and in the absence of a serious purchaser, it already looks likely that further development of the product will cease. At Comdex in Las Vegas in mid November, the Novell stand was dutifully demoing the latest version, in a scene reminiscent of the way chickens continue to twitch after their heads have been cut off.

Contrast WordPerfect's plight with Microsoft's. Microsoft appears to hold a brilliant hand. It dominates PC operating systems, and with Office has close to 90 percent of the desktop applications market. Bill Gates' keynote speech at Comdex outlined a glittering future for a future version of Office based around an object architecture, and with an integrated user interface that effectively insulates users from even knowing which application they are using.

Yet Gates admits to feeling vulnerable. Success, he says, is a poor teacher, and the more successful Microsoft becomes, the more companies set out to try and beat it at *something*.

Also at Comdex, Apple, IBM and Motorola finally announced the completed specifications for the PowerPC Platform, formally known as the Common Hardware Reference Platform. It promises a single-standard architecture for the next generation of personal computers able to run a variety of operating systems including Mac OS, OS/2 and Windows NT.

A lot of question marks still hang over the PowerPC Platform. When will components for the new machines be available in volume? When will the high-end 620 PowerPC chip become available? Yet if the platform can maintain its commitment to genuine openness, it has a chance of success. The prospect of millions of PowerPC machines running the Mac operating system is an enticing one. Ironically, though, the operating system most likely to make a success of the PowerPC platform is Microsoft NT with the Windows 95 interface. Perhaps it's Intel, not Microsoft, that needs to worry.

- Novell sells WordPerfect, p18
- PowerPC Common Hardware Reference Platform, p22



Ben Tisdall
Editor

Next Month **Personal Computer World**

Pentium Pros

— Intel's next generation processor brings the fastest PCs ever

Access 95

Microsoft's top database goes 32-bit

Group Tests

HIGH SPEED MODEMS

Get online with the fastest modems yet

VISUAL PROGRAMMING

PCW compares the top programming tools

February 96 issue

— On sale Thursday 4th January

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Comdex Online

You can read more Comdex news and views at our Web site, which maintained a daily bulletin during the show. The address is <http://www.vnu.co.uk/ln/comdex>

WordPerfect is up for sale

Networking giant Novell put WordPerfect up for sale last month in what looked like a final capitulation to Microsoft in the office applications market. The move is the latest in a string of seismic shifts in the industry caused by the launch of Win95 and the apparently unshakable power of Bill Gates and Intel.

WordPerfect was once by far the world's best-selling word processor, but it began to slip with the move to what-you-see-is-what-you-get and it fell badly behind when the first Windows version proved flaky. The product improved but its prospects did not: it fell inexorably behind Microsoft Word, which gained 85 percent of the market as part of the Office suite which is bundled with a large proportion of new PCs.

Lotus, the only other contender with its SmartSuite, was bought by IBM in July.

Novell is selling its business applications division, which as well as WordPerfect includes the Quattro Pro spreadsheet that it bought from Borland last year. But it will retain Groupwise products which fit in with its strategy of refocusing on

networking — the reason Novell shed its Unix interests in October.

Chief executive Bob Frankenberg said that two prospective buyers had already come forward. Rumour had it that one was Ray Noorda, who was responsible for buying WordPerfect and Quattro last year for £909m and £94m respectively.

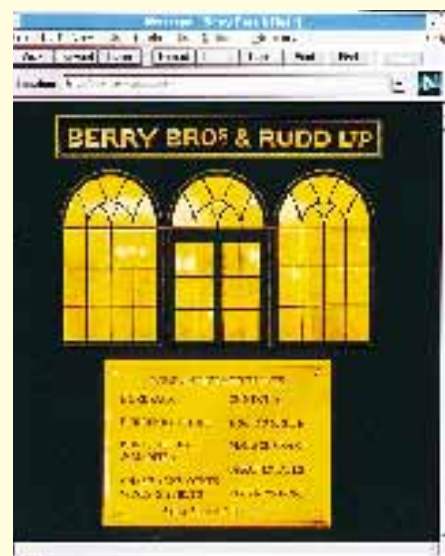
One estimate put the current value of the division as low as £125m.

The shifting of the great software houses was mirrored in the hardware world with the merger of two of the companies trying to chip away at Intel's near monopoly. AMD took over NexGen, hitherto its rival in making emulations of Intel chips (see *News Analysis*,

page 33).

The anything-can-happen atmosphere was illustrated by a joint launch by AMD and Reveal of a cheap, high-quality sound card at which news of the Nex-Gen deal emerged. Days later, Reveal was bought by Creative Technologies.

Clive Akass



Berry good... wine merchant Berry Bros and Rudd, established 1698, claims to be the oldest firm on the web. Its address is www.berry-bros.co.uk.

IBM chief upstages Bill Gates' soap opera

The future of computing lies in networking, the heads of both IBM and Microsoft agreed in Comdex keynote speeches last month. But their views of the emerging mega-connectivity differed radically.

Lou Gerstner, giving voice to a renewed confidence at IBM, predicted a drift of power

from the desktop to the network and server, and away from monolithic suites to small downloadable modules (see Tim Bajarin's *Analysis* on page 31).

Gates presented one of his skilful extravaganzas, in which he interacted with a screened mini soap opera depicting the near future with the internet as a

natural extension of the desktop; a future in which people do business via a Microsoft Office with multimedia knobs on.

It was a plausible extrapolation, spiced with some wishful thinking, but the exciting new ideas are coming from outside Microsoft: companies like Sun and Netscape, with their cross-

platform Java initiative, and even staid, suited IBM.

Gates, noting his 40th birthday, admitted that he was starting to feel out of touch. "People say I'm the Mick Jagger of the computing industry," he added. "I'm not sure what that means."

● **Comdex special report, pages 22 and 23.**

Enter the software clone, with full sound effects

A new bundle from German multimedia specialist, Miro, includes close imitations of Word 6.0 and Excel 4.0 — the industry's first software clones.

The emulations contain only a limited set of the features offered by the Microsoft versions, but the precedent could be significant if software moves away from massive do-it-all suites towards small "components" which you buy and load only as needed.

It could open a can of worms in the mobile market, too, which has a need for small, basic programs and is not so tied to the Wintel platform.

The clones are part of an interesting package called miroCONNECT Office, which bundles LapLink 6.0 remote control software, a full suite of Chameleon internet modules, an AutoRoute-like mapping module, with fax and datacoms software, plus a multi-purpose 28.8Kb/sec fax-modem/sound card — all for less than £250.

LapLink has been tweaked to allow simultaneous voice and data calls, allowing you to

control a remote PC while talking to the user.

Product manager, Hartmut Bauer, said that Microsoft had seen the products and was happy about them: "They told us we were unlikely to make any impact on their sales."

There have been many lawsuits over software copyright infringements in the US, but the position is by no means clear in Europe, especially over similarities in "look and feel".

● Delrina, newly taken over by utilities specialist Symantec, has launched a comprehensive suite of 32-bit communications programs for Windows 95. Delrina Commsuite includes Winfax

7.0, WinComm Pro 7.0 for general datacoms, and Cyberjack 7.0, which integrates a complete range of Internet facilities. All support multitasking and multithreading under Win95. It will be available this month at £129.

Delrina 01734 814230;

Miro 01494 510250



Larry seems to be getting everywhere these days. This cartoon is one of several in a free booklet on email etiquette from AT&T Easylink (for further details, phone 01527 514514) A £9.99 CD of his cartoons, for newsletters and the like, is available from The Data Business. Telephone 01865 842224.

Digital's Santa clause offers free support for Christmas

PC support is set to become big business during the next five years as both software and hardware vendors struggle to cope with a 400 percent growth in the number of users, according to Digital.

The company is moving into support in a big way with an 8a.m. to 10p.m. service targeted at small businesses and home users. It will support all of the leading PC brands as well as software packages.

To help people get the message, Digital is offering the service free on Christmas Day and Boxing Day to anyone having trouble with presents in the form of any make of PC or software.

The service is also expected to be used by small dealers to ease the burden of supporting

customers. Big vendors such as Compaq already use Digital to help provide support.

Marketing director, David Allen, said users were fed up with having to hang on to support lines waiting for someone to answer, only to be told that they have to ring another number.

"So many products go into a PC, the vendors can always blame someone else for a problem. Digital uses experts on all aspects of the PC, hardware or software so you only have to ring one number," he said.

The new service will initially cost £117.50, including VAT. The first five calls are free, after which you pay £20; so in effect signing on is free, Allen said.

Digital 0345 440011

Short Stories



● This heartfelt entry from a group at Inverkeithing Primary school in Scotland won the under-eight's category of the 1995 National Educational Multimedia Awards. The closing date for next year is 31st March.

NEMA 01203 416994

SoftRAM users offered a refund

● Purchasers of SoftRAM, which claimed to effectively double a PC's memory, have been offered their money back or a free upgrade following a devastating report by the US National Software Testing Laboratories.

The report, commissioned by rival RamDoubler publisher, Connectix, stated that SoftRAM offered no benefits to Windows 3.x or Win95 users.

A second test, commissioned by SoftRam developer, Synchronys, was said to show benefits under Windows 3.11 but confirmed "a fault" under Win95. Synchronys says this fault has been cured. UK distributor, Roderick Manhattan, has set up a special upgrade hotline on 0181 875 4434.

Musical interlude

● Recorders are refined musical instruments at stocking-filler prices and if you are thinking of getting your child one for Christmas, you might also consider buying this little utility to make sure they get the most from it. Recorder for Windows shows both the fingering and music for a number of popular tunes, and will also play the music if you have a sound card. It costs £4.44 as shareware, or £16.95 registered.

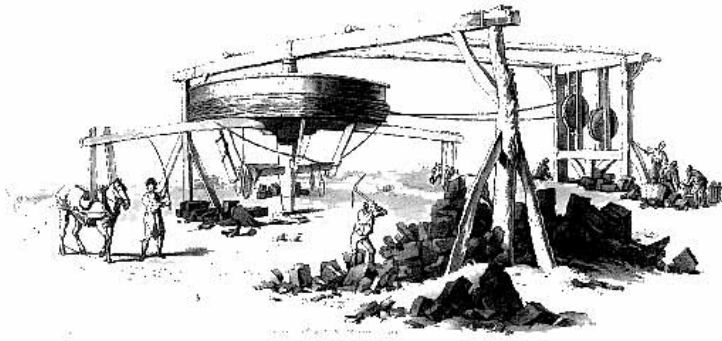
SpringSoft 01352 770049



CD with a lot of horsepower

The contraption shown here, for getting coal out of a mine, would be unlikely to pass a Health and Safety inspection these days, and must have looked old-fashioned even when this drawing was made, by William Pyne (1769-1843) at the turn of the nineteenth century.

He was depicting mechanisms that had been in use for centuries, but his picture shows, incidentally, how the power of new-fangled steam engines came naturally to be measured in terms of



horse power. It is taken from a new CD called *Mechanisms* (£49 for a single user or £99 for a site licence). It is available from Creative Curriculum Software, and is the first of a planned technology series for schools.

Gates faces new Euro-probe over 'unfair' Office discounts

Britain has asked the European Commission to investigate Microsoft's policy of granting big discounts to major PC vendors. The move may revive anti-monopoly investigations in Europe which were shelved after a much-criticised deal with US authorities last year.

The complaint was originally

made to Britain's Office of Fair Trading by the Personal Computer Association, representing dealers and other industry interests, which says that the discount enjoyed by Eire-based US companies like Gateway "unfairly discriminates against UK companies" to the extent that some could be put out of business.

PCA executive director, Keith Warburton, said a variation in wholesale prices of up to 30 percent was to be expected. "If you lose to the competition in one way, you can make it up in another. That goes for anything, with the exception of Office where if you can enter a contract for a million, you can get it for, say, 60 percent cheaper. If Gateway can get Office Pro at, say, £50 when we have to pay over £200, we have a differential that we cannot possibly set off."

An OFT spokeswoman said: "We passed the complaint on to the EC because it has wider international implications." She agreed that the OFT would not have done this if it did not think the complaint had some substance.

Gateway UK general manager, John Shephard, said he had no sympathy with the PCA view: "I would get upset if it was the customer who was complaining. But this is good news for the customer. What Warburton is saying is that small vendors can't offer the same value as we can. I can't get too upset about that."

He said smaller companies could make money by "skilfully manipulating" specialist markets.

Facing up to the security issue



A unique identification and authentication security system relies on our ability to recognise faces as an alternative to using passwords or PINs. Visage

requires you to memorise three faces, but not from your family; this would be equivalent to using your spouse's name as a password. Identification consists of picking out the faces from a random selection. The company quotes the government GCHQ listening centre, describing it as "the biggest single advance in security since the invention of the password." The system can be used with Netware and Windows, and further development is under way for more O/Ss.

Visage 01442 230471

Dylan Armbrust

Short Stories

Win95 security bug 'fixed'

● A security problem with file and printer sharing in Win95 has been fixed, claims Microsoft.

The problem, which affects only those users who have turned on the Enable File and Printer sharing option, means that others on the network gain read-only access to your files.

You can fix the problem by downloading new drivers from www.microsoft.com.

SoftWerk tracks heads, not hits

● Market Focus is a Windows tool for analysing web-site traffic. Developer, SoftWerk UK, claims that the £465 CD-based package differs in that it counts users rather than the number of "hits" they make.

Graphs, bar charts and tables reveal trends, and sorted lists from log files to unlock valuable marketing information, can be easily created.

Joanna Scott

SoftWerk UK 01462 832244

Notebook users vote for H-P

● Hewlett-Packard ranks highest for customer satisfaction among notebook users, according to a new survey.

It scored 117 for reliability, reputation, screen, portability and keyboard. Dell followed with 112, leading on value and compatibility, in the JD Power 1995 Notebook Computer End-User Satisfaction Study.

Root and branch

● A Deluxe Win95 version 3.0 of Family Tree Maker is available on CD. It contains more than 115 million, mainly American names and allows you to view archive CDs. Access to the World Family Tree is included, a growing pool of CDs compiled by users. Price is £49.95; upgrades from £25.

S&N Genealogy Supplies 01252 378054





**Tim Bjarin
in the US**

AST? Play it again, Samsung...

● Samsung must be scratching its head over its \$850m investment in AST. It paid \$22 a share last spring; the price is now hovering around \$8 per share. At the end of 1994, AST was one of the top five PC vendors; today, it is barely in the top ten.

Chairman and co-founder Safi Qureshey has not been able to turn it around. So, news that Ian Diery, former Apple VP of marketing, has been appointed president has been seen as positive. He replaces James Schraith, who resigned a couple of months back after being widely blamed for the decline.

Diery is no visionary, but he is a solid marketing manager who will bring new enthusiasm and focus. But his task is gargantuan. He has to find products that customers really want, and regain the loyalty of corporates who have begun to drift to Compaq and IBM.

Take 24 Twinkies

● A cookbook called *Giga Bites*, written by Jenz Johnson and published by Ten Speed Press, would make a great gift for a hacker — a breed well known for junk food addiction. It features recipes to cater for that late-night pizza or doughnut craving.

My favourite is Twinkie Casserole. This calls for 24 Twinkies (small sponge cakes), 24 Oreo biscuits, a large jar of caramel topping, a bag of miniature marshmallows, a large jar of hot fudge, a tablespoon of cinnamon, and a dash of brown sugar.

Scary Gates

● Intel CEO, Andy Grove, got a lot of chuckles when he wore a Bill Gates mask at a Halloween meeting of finance experts and asked them: "As a Halloween present, may I have his [Gates's] price/earnings ratio?" Microsoft's rating is 39, Intel's is 20. Then, removing the mask, Grove added: "It's a scary sight, isn't it."

COMDEX Fall '95

4.7Gb super-CDs on sale next year

Next-generation CD drives taking disks with a minimum capacity of 4.7Gb (seven times that of the current generation) will be available by the end of next year, industry leaders pledged at Comdex.

Heavyweights from consumer electronics giants like Matsushita, Toshiba, Thompson, and Philips lined up at a press conference to quash rumours that they had reached a deadlock on the details of a compromise

between the rival SD and MMCD standards.

The compromise, announced in September, adopts most of the SD specification backed by the likes of Time-Warner, Toshiba and Matsushita, but incorporates the more rigorous error correction proposed by MMCD backers Philips and Sony.

Toshi Yajima, Toshiba's deputy general manager, admitted that both sides had still to agree on matters such as royalties, but promised that a full

technical specification would be published in December. "This will allow manufacturers of drives, disks and silicon to get to work on products while discussions continue on outstanding issues," he said. It would mean products will be available, for late 1996.

Double-sided versions of the new disk will hold 9.4Gb, and a future version will hold up to 17Gb. Rewritable versions are in the pipeline too, although initially they will have slightly less capacity.

Clive Akass

Power PC Platform sets the scene for innovation

IBM, Apple and Motorola have announced the Power PC Platform, the specifications for a standard PC architecture based around the Power PC chip. Formally known as the Microprocessor Common Hardware Reference Platform (CHRP), they are claimed to offer lots of room for innovation by PC designers.

AIX, Netware, OS/2 Warp, Sun's Solaris and Windows NT are all expected to run on the new machines. And Apple says work is progressing on a ROM-less version of the Mac operating system for the new platform.

Volume production of PowerPC-specific components is promised for the second half of '96. A number of chipset and peripheral vendors are backing the standard, including VLSI and 3Com.

IBM plans to move its RS6000 wordstations to the spec later, in 1996, with the servers to follow. IBM denied press reports that the future of the high-end 64-bit 620 PowerPC process was in jeopardy. It claims early silicon is now being tested, with clockspeeds of over 300MHz expected by 1997.

Ben Tisdall

Compass points



Two novel new products could confirm Quarterdeck as Netscape's main rival for Internet software. *Internet Compass* is a means of trawling the Net for information, by querying several major search engines such as Infoseek and Yahoo. But it can also be set up to do regular searches to produce, say, a daily bulletin on chosen subjects. It includes facilities for organising your data. *Compass* will be on sale before Christmas for less than £70. *Web Talk* (shown above) allows real-time telephone conversations over a Net link. It will cost less than \$35 in the US, complete with a mike, Quarterdeck's Mosaic browser, and a month's Net access. Quarterdeck has also upgraded Mosaic to support Netscape-specific HTML formats and Adobe's Acrobat portable document format.

Quarterdeck UK 01245 496699

Gerstner's vision of the future

In his keynote speech on the first day of Comdex in Las Vegas, Louis Gerstner, president and CEO of IBM, outlined his vision for the future of computing. Gerstner believes we are on the threshold of the next phase of information technology — network-centric computing, and pledged that IBM is betting much of our future on it.

He explained that client/server has proved more expensive and more complicated to implement than anyone expected, and the cost of supporting a PC with the processing power of a 1985 mainframe on every desk is high.

Gerstner predicts that more power in terms of applications, processing, and memory will migrate back to servers, enabled by broadband high-speed networks, particularly ATM. This will free users from having to upgrade their PCs every year; and from feeling they're constantly falling behind current technology; and from dealing with arcane things like operating systems. PCs, said Gerstner, are the most brilliant examples of planned obsolescence he's come across, in any industry.

He went on to reveal that such a low-cost networking appliance is now under development in IBM's labs and will be released to some customers next year. The Internet, he said, is the most powerful manifestation, so far, of what net-centric computing will be like. But the IT industry faces three major challenges to achieving progress: ease of use, open standards, and the social implications of technology. Entire segments of our



industry, said Gerstner, have been spawned by the failure to deliver ease of use. The failure to deliver open standards had resulted in a near death experience for IBM.

Finally, the social implementations of technology must be considered: intellectual property rights on the Internet, its misuse as a means of distributing pornography, and the issue of universal access. Gerstner cited a *Time* survey in which nearly half of respondents stated that access to technology was responsible for economic divisions.

Ben Tisdall

Short Stories

Tiny Thinkpad sees red

● A palm-sized IBM Thinkpad was on view in a side room at Comdex — but only to demonstrate its infra-red port.

The tiny PC110 measures about 6ins x 4ins and incorporates an ordinary plug-in phone, and is available only in Japan. The qwerty keyboard is too cramped and stiff for comfortable typing.

A slightly larger version with a type 3 card slot was also on view.

Camera news

● Chinon America demonstrated the \$499 fully automatic ES-1000 digital camera capable of storing eight 24-bit colour images, or 128 with an optional 16Mb flash card.

Epson offered the \$499 PhotoPC providing 640 x 480 and 320 x 240 resolutions, with 1Mb of flash storing a minimum of 16 images.

Wyse move

● Wyse Technology's Winterm terminals have brought Louis Gerstner's vision of net-centric computing a step closer.

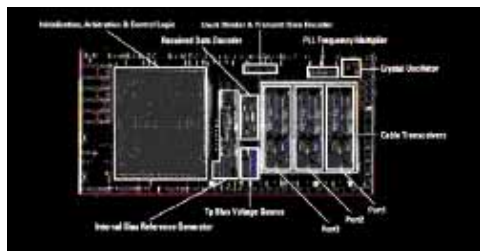
They cost between 25 to 50 percent less than a PC, but when connected to a Windows NT application server will bring the full range of Microsoft applications to the desktop, with the advantages of easy administration and high security.

The Winterm 2500 colour terminal is expected to cost around \$750 when it ships in late December. A greyscale version will cost \$500.

Quick chips

● Virge 3D accelerator chips will cut the cost of a 3D accelerator card to as little as \$200, says the manufacturer, S3. Seventeen add-in card manufacturers and fourteen games developers plan to support the Virge and Virge/VX. The chips take advantage of the 3D support built into Windows 95 and will drastically improve the performance of 3D games such as Doom.

Fast data ports come onstream



The new Universal Serial Bus (USB) will be on all Intel motherboards, and thus on a large proportion of new PCs, by the end of 1996, the company announced. Intel believes USB, demonstrated in a side room here at Comdex, will eventually replace the familiar COM1 and COM2 ports.

It's designed to daisy-chain devices such as a mouse, keyboard and printer. Support chipsets are due to ship early next year.

USB is very cheap and simple, using a four-wire cable the size of light flex which can carry power as well as a data rate of 12Mbps/sec.

Two other connection technologies, high-speed infra-red and Firewire, are also coming onstream.

Firewire (see above), also called 1394, is seen as a faster complement to USB. The cabling looks similar, with either four or six strands: two twisted-pair data paths and an optional pair for power. Firewire presently carries up to 100Mbps/sec, but 400Mbps/sec is on the horizon and 1Gbit/sec is planned. It is designed for

consumer items like digital camcorders as well as computers.

Texas Instruments showed a PCI-based Firewire port, and the 1394 Association demonstrated Firewire maintaining a full-screen video picture at 30fps.

Infra-red has been given a boost by Microsoft's launch at Comdex of an IRDA driver for Win95, enabling applications to use an IRDA port like a standard serial port. This means vendors can no longer cite software development costs as an excuse for keeping prices of IRDA add-on ports high — as much as \$100 for a couple of dollars' worth of silicon.

That price is for IRDA 1, which passes data at 115Kbits/sec; Sharp gave a demonstration of videoconferencing using a more expensive IRDA 2 link, which can manage 4Mbps/sec. **Clive Akass**



Short Stories

Post box

● Digital Mail is offering an electronic postbox service which allows you to collect faxes, email and voicemail for a basic £5 per month. The first 20 minutes is free, after which each minute costs 10p.

Digital Mail 0171 231 2929

Code decoder

● An updated version of STD Code Decoder, which tells you the geographical location of a phone number, is available for £20.

Oakley Publishing 01508 538546

New batteries

● TeleAdapt has replacement batteries for leading notebooks such as Toshiba, Compaq, IBM and Dell. Users can also upgrade to lighter, longer-lasting, NiMH batteries.

TeleAdapt 0181 421 4444

120MHz Latitude

● Dell's Latitude Xpi range of notebooks now includes a model using Intel's new battery-friendly low-voltage 120MHz Pentium chips. It also uses an 10.4in SVGA active-matrix colour display.

Dell 01344 720000

Mac con Brio

● EuroSource has produced a native PowerMac version of its BrioQuery database query tool. Details are at www.eurosource.com.

Eurosource 0181 561 1993

Charities on Web

● Free information on 5,000 British charities is available at www.hemscott.co.uk.

Basic training

● The Visual Basic User Group is holding briefings for VB 4.0 developers in London on 19th January, and in Manchester on 9th January. They cost £149, or £99 for members.

VBUG 01291 620720

Fontastic!

● Walnut Creek offers a £24 CD called Font Garden with 500 fonts in TrueType and Type 1 PostScript formats.

PDSL 01892 663298

Refund offer as Microsoft admits Access needs 12Mb

Microsoft admitted last month that the new version of Access needs 12Mb of RAM and offered a £99 refund to users who cannot, or do not want to, upgrade accordingly.

The admission came in a letter to users who bought Office Professional for Windows 95.

Oliver Roll, product manager of desktop applications, wrote on 1st November:

"After careful discussion with Beta users, we have decided to raise our memory recommendations for Microsoft Access for Windows 95 from 8Mb, as previously stated, to 12Mb."

At current memory prices, an extra 4Mb of RAM will cost around £150 (inc VAT) but many PCs will only allow an upgrade jump to 16Mb.

Microsoft regards this as a

"small change" but accepts that it "may be significant to some customers, particularly if your computer is currently configured for only 8Mb of memory". So Microsoft will give £99 to customers who have bought Access and now cannot use it.

The Professional Edition of Microsoft Office for Windows 95 shipped with a picture of Access on the packet, along with the four Office Standard programs: Excel, Word,

PowerPoint and Schedule.

The packaging specified 8Mb "to run Access or two other programs on Windows 95". But Access was not included. Customers received a ROM containing Office Standard and a voucher for "Access for Windows 95 software when available".

Roll's letter, to people who returned this voucher, contained another voucher. This asks Microsoft "not to ship me my copy of Access for Windows 95". In return Microsoft will send a cheque for £99, within 28 days.

Otherwise, customers will get Access for Windows 95 "when it is available". No timescale is given. Some users may now reasonably wish they had not hurried to buy Windows 95.

Barry Fox



Fake cache has users jogging their memory

Dodgy dealers are reported to be selling machines with fake cache RAM, or none at all.

They rely on the fact that there is no simple way in which novices can check that the cache has actually been fitted, although a tell-tale message may appear during boot-up — fake chips can fool the BIOS into thinking that the cache is present.

A PCW reader, who was alerted by a BIOS message, was informed by his dealer that his cache had been dropped in favour of fast EDO RAM. Cache memory can speed a PC by as much

as 30 percent; the benefit of EDO RAM is marginal by comparison.

The reader's complaint is being investigated by local trading officials, who say that they have difficulty finding expert witnesses to testify in such cases.

The issue is discussed in the Usenet group, comp.sys.ibm.pc.hardware.chips.

A utility called CompTest, freely available from several web sites, can detect false cache but is thought not to be infallible.

Web pollution blacklist attacks secrecy

A new web site, naming Britain's worst polluters, has been launched by Friends of the Earth (FoE) as part of a right-to-know campaign.

The information on the country's dirtiest factories was taken from official statistics

which are technically in the public domain but which, FoE claims, were only obtained after a high level of persistence had been employed.

FoE claims that similar information is published as a matter of course by US authorities.

Deputy campaign director, Tony Juniper, said: "It's up to all of us to make the Government and industry come clean and tell us the whole truth about environmental destruction."

The address is: <http://www.foe.co.uk/cr>.

Short Stories

QuickView upgrade

● UK file-translation specialist, Software Compatibility Centre, is offering a wysiwyg version of the QuickView file viewer in Windows 95.

Microsoft bought in the technology for QuickView from SCC, publisher of the Windows 3.x-generation Outside In file viewer. But the version that ships with Win95 does not format text.

QuickView Plus for Win95 overwrites the Microsoft version. It provides fully-formatted views of more than 200 word processor, spreadsheet, database, graphics, and compressed file formats. The single-user price is £49.

SCC 01344 885224

Laser giveaway

● More than 1,500 laser printers have been given to schools via a scheme set up by Gestetner, which services and cleans old models donated by firms who are upgrading.

The Clydesdale Bank gave 400 machines and Marks and Spencer donated 200. Phone 0990 143157 if you have equipment to donate.

Welsh on check

● A £45 Welsh spelling and grammar checker, compatible with leading word processors, is available in DOS and Windows versions from the Welsh Language Board.

WLB 01222 224744



Fast Mirage

● Spea has launched the Mirage multimedia accelerator for £260 with a TV tuner, or £190 without. An MPEG decoder costs £100 extra.

Spea 01844 261886

CheckIt '95

● Touchstone has launched WinCheckIt 4.0, a £39.95 Win95-compatible version of its troubleshooting package.

Touchstone 01442 862612

Hard disk capacities to get bigger and cheaper

Hard disk capacities are set to double every six months, with the price per megabyte falling by half, according to Fujitsu. This means we could soon be seeing multi-gigabyte disks in entry-level machines.

The advances are enabled by new magneto-resistive (MR) heads, and a digital sampling technique called Partial Response Maximum Likelihood (PRML) which enables up to 50 percent more data to be stored on a platter.

Last month, Fujitsu announced a 2.5in two-platter 1Gb drive, a 4.4Gb five-platter, and an 8.8Gb ten-platter. It said a 1Gb single-platter will be available early next year.

Fujitsu claimed that only itself and IBM have the technology, with which it expects to gain a 20 percent share of the hard-drive market.

But both Quantum and Conner announced MR/PRML drives. Quantum says it will ship a 1.7Gb drive (pictured) and a 2.55Gb drive in



March, priced at \$265 and \$395 respectively. Both use MR and PRML.

Fujitsu technical marketing manager, Mike Nelson, said: "Everyone is going to have to bring out MR drives but they have a long way to catch up. We are now on our third-generation product."

Fujitsu 0181 5734444; Quantum 01344 353500;

Conner 01628 777277

NEC's pocket video player highlights falling ROM prices

The price of solid-state memory will plummet over the next four years, says NEC. And to illustrate the possibilities it has produced a pocket video player drawing MPEG-1 data from a memory card (see *Gadgets*, page 56).

The Walkman-sized demonstration model used a 40Mb memory card with only four minutes of film. But the falling price of ROM means the use of cards of a much larger capacity will become feasible.

NEC says a 1Gbit flash EEPROM chip, which cost \$3,840 in 1993, will cost only \$128 in 2000AD, and a non-rewriteable 1Gbit ROM chip will cost just \$2.70.

A 90-minute feature length film occupies about 900Mb, or about \$20 worth of ROM at NEC's estimated prices. Clearly, cheap solid-state memory could also have a big impact on mobile computers.

NEC 0181 993 8111

Cheap CD recorder bundles on offer

Plasmon has come up with a low-cost CD recorder package to rival that of the Hewlett-Packard Surestore CD-Writer 4020i. Both are based around a Philips 4020 drive and both are listed at £850.

H-P kept its price down by bundling a cheap SCSI card with no external connection, and a "Lite" version of Incat's Easy-CD software. The Plasmon CDR4220 has no SCSI card but a full, professional version of Easy-CD for Windows 3.1, Windows 95, and the Mac. The company says a basic Adaptec SCSI

card (about £50) will suffice.

Marketing director, Stewart Vane-Tempest, said he believed most users would need the facilities provided by the professional software, which provides full support for PhotoCD and multi-session recording.

There have been reports that the H-P package has problems under Win95, stemming from the fact that CD recording requires an uninterrupted stream of data. This is not a problem with Windows 3.x, because the application can grab processor time as needed; under Win95, it has

to bow to the operating system.

But the H-P and Plasmon bundles both include a 1Mb buffer, which Vane-Tempest claimed should be enough to maintain a smooth data flow if you close other applications.

He said the CD recorder should not be regarded as a backup device, which requires a read-write drive (such as Plasmon's \$600 dual PD and CD drive). He added: "CD is an ideal distribution medium because there are so many CD drives out there."

Plasmon 01763 262963

Compaq bug claim as rivals rush out new Pentium Pros

Compaq claimed to have found a networking problem with Intel's new Pentium Pro processor last month, shortly after it was formally launched with sample chips at speeds as fast as 200MHz.

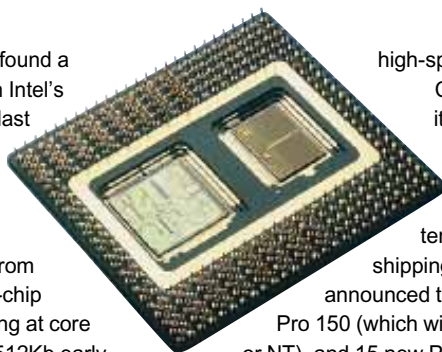
The Pentium Pro differs from the Pentium in having an on-chip 256Kb level-2 cache operating at core speed. This will increase to 512Kb early next year. Some PC makers say they expect speeds to be as high as 300MHz in 1996.

Intel is initially aiming its sales at the server and high-end workstation markets that use dedicated 32-bit applications. Firms involved in the financial, animation, and scientific fields are the first targets.

Carl Everett, senior desktop products VP, said that Pentium Pro systems "will bring PC economics into market segments that haven't seen PC-style price/performance."

Compaq claimed that Pentium Pro machines could, in certain circumstances, drop off a network and fail to communicate with other linked computers.

Intel states that this is a Compaq-specific problem, related to its use of "legacy" network cards being unable to cope with



high-speed data transfer.

Compaq has delayed shipping its Pentium Pro models until the problem is resolved.

Other PC manufacturers have not encountered this problem and are shipping according to schedule. Dell announced the 150MHz Dimension XPS Pro 150 (which will come preloaded with Win95 or NT), and 15 new Pentium systems.

Digital's Celebris workstation is processor independent, with a swappable daughterboard carrying a Pentium, Pentium Pro or Digital Alpha chip.

Gateway and Apricot say they will ship 200MHz Pentium Pro machines next month, and Fujitsu/ICL offer a 166MHz model.

Digital 01734 202180; Dell 01344 72000;

Gateway 0800 552000; Apricot 0121 7177171

Dylan Armbrust

Best practice, on the face of it...

Sixty percent of the effort put into creating an application goes into the graphical interface, says the developer of a new design tool.

Good screen design is the best way to ensure your application is among the one in six applications that are considered a success, says Christine Comaford, president of Corporate Computing which

developed the online reference system, GUI Guidelines. It is aimed at small businesses and corporates who want to standardise their screens.

Corporate Computing is now owned by LBMS, a UK company best known for the SSADM development methodology. GUI Guidelines is offered at an introductory price of £99.95. LBMS 0171 636 4213

No life online for Dictionary of Biography

All 32 volumes of the *Dictionary of National Biography* (DNB), documenting the lives of more than 40,000 people, have been published on a single CD.

The Oxford University Press (OUP) plans eventually to extend the scope of this work by including extra information such as birth certificates and wills, either directly or in the form of pointers to sources.

This could be done even more efficiently with a Web version, but there are no plans to set one up at present because the OUP believes there is, as yet, no satisfactory way of charging for usage.

However, the *Encyclopaedia Britannica*, now US-owned, can be accessed online



Britannica: rules the online waves

(www.eb.com) with subscriptions starting at around £75 per year.

The OUP is a charity with a remit to spread knowledge; it nevertheless makes money which it says is needed to finance expensive works like the DNB. The CD version, which costs £395, will effectively be in the public domain as many

copies will be bought by libraries.

As it is, many DNB contributors will have a long wait before seeing their work in print.

Sir Alexander Cairncross, who rewrote the DNB entry on the economist John Maynard Keynes, said: "I am told that the next printed version won't be out until the next century."

OUP 01865 267979

Short Stories

How many trees fit on a CD?

● Question: How many trees provide the equivalent, in paper, of a standard CD-ROM? Answer: 11, with each taking 20 years to grow. This corresponds to a 47ft stack of A4 paper.

The figures come from Martine Tatman, of CD and audio cassette replicators Ablex Audio Video. The coming 4.7Gb high-density CD would save 78 trees — equivalent to 1,560 tree years.

Joanna Scott

Amstrad image

● Amstrad is second only to IBM and Apple among Britain's best-known computer firms, according to the advertising agency DMB&B. IBM is seen to lead in terms of quality and standing, but Amstrad and Apple outstrip it for perceived value and innovation.

Portable CD

● Opti is selling a quad-speed portable CD-ROM with a PCMCIA-compatible interface.

Opti 0181 507 1818

Paradox 7.0

● Borland says Paradox 7.0 for Windows 95 and NT will go on sale this month for £99, or £69 as an upgrade, or £79 to users of an applications suite.

Borland 01734 320022

Win95 sales

● Microsoft claims seven million copies of Windows 95 were sold worldwide in the two months after its launch.

Magic of money

● A Christmas stocking filler for power-mongers might be the £34 Interactive Magic game which challenges players to build financial empires.

Interactive Magic 01276 62462

Digital album

● TGL Multimedia's £40 Picture Album lets you organise your photographs as an interactive multimedia show.



Short Stories

New Newton OS opens Windows

● A new operating system for the Newton palmtop is designed for easy integration with Mac and Windows systems. A new £59 module, called Newton Press, will allow a Word and ClarisWorks document to be displayed on a Newton.

The Newton 2.0 operating system should be available now for an upgrade price of £80, or £424 with a Newton MessagePad 120 machine. A £79 keyboard option is also available for the Newton.

Apple 0181 730 2480

'Fastest yet' Mac compatible

● Power Computing has produced what it claims is the fastest yet PowerPC machine running the MacOS.

The new PowerWave is the first to use the 150MHz 604 PowerPC chip and is the first MacOS compatible to have a PCI bus. A custom chip also allows NuBus cards to be used. More details at www.powercc.com.

Power Computing 001 512 258 1350 (US)

New DTP pack takes on Quark

● A UK company is making a surprise bid for the DTP market. UniQuorn, unveiled at the Apple Expo by SoftPress Systems, boasts some unique features including interactive preview of colour trapping and automatic creation of style sheets.

It uses XPress-style boxes for inserting text and graphics, but, unlike XPress, the same boxes can be used for both. Text can be flowed around bezier curves, too. Currently in beta, UniQuorn will be available for Mac and Windows platforms.

SoftPress 01993 882588

Newsprint welcomes your news, views, Web sites and graphics. Send them to **cakassa** at **CIX** or **clive-akass@pcw.cmail.compuserve.com** or **cakass@dial.pipex.com**

New 3D accelerator card puts PowerMacs into workstation class

Apple has released a QuickDraw 3D accelerator card which it claims provides PCI-based PowerMacs with workstation class 3D graphics performance.

Unveiled by Apple CEO Michael Spindler at a Macromedia conference in San Francisco, the hardware makes 3D applications run up to 12 times faster.

Based on custom ASICs, the new card provides hardware support for QuickDraw 3D — Apple's cross-platform application programming interface for 3D graphics.

It supports full texture mapping, Gouraud shading, transparency and Z buffering. It can render 10 million tri-linearly filtered, mip-mapped texture pixels per second and up to 120,000 triangles per second.

This level of performance has only previously been available on high-end, high-priced systems.

"When Apple introduced QuickDraw 3D we revolutionised real time 3D



This early demonstration of Quickdraw 3D features texture mapping and complex shading. The image is updated in realtime as the camera moves smoothly along the rollercoaster track

graphics, making them as easy to use as text and 2D graphics," said Spindler.

"Today we take another technological leap forward with a hardware accelerator card that provides customers with the additional power necessary to produce complex 3D illustrations, designs and

animation with the quality and speed they demand, and at a price they can afford."

The card will be aimed at the graphics and entertainment markets, and will retail in the US at \$399.

No UK price or delivery date has been set.

Chris Cain

Top 10 Windows and DOS		
Product	Manufacturer	Last month
1 Windows 95 U/G	Microsoft	1
2 SoftRAM Memory Doubler	RMG	2
3 MS Office Pro 95 U/G CD	Microsoft	18
4 First Aid 95 for Win95	RMG	-
5 MS AutoRoute Exp UK & IRE	Microsoft	-
6 MS Plus for Win95	Microsoft	3
7 Lotus SmartSuite	Lotus	-
8 MS Office 4.2 U/G	Microsoft	4
9 RAM Doubler	Connectix	11
10 Uninstaller v3.0	Microhelp	6
Top 10 DOS		
1 PC DOS Version 7	IBM	1
2 Flight Simulator v5.1	Microsoft	3
3 QEMM v7.5	Quarterdeck	2
4 Turbo C ++ v3.0	Borland	5
5 MSDOS v6.22	Microsoft	-
6 Pegasus Solo Payroll	Pegasus	8
7 Turbo Pascal v7.0	Borland	-
8 Easy to Learn Computing	VCI	7
9 MS Space Simulator	Microsoft	-
10 Pegasus Solo Accounts	Pegasus	9

Top 20 Windows		
Product	Manufacturer	Last month
1 Windows 95 U/G CD	Microsoft	1
2 Softram Memory Doubler	RMG	2
3 MS Office Pro 95 U/G CD	Microsoft	18
4 First Aid 95 for Win95	RMG	-
5 AutoRoute Exp UK & IRE	Microsoft	-
6 MS Plus for Win95	Microsoft	3
7 Lotus SmartSuite	Lotus	-
8 MS Office 4.2 U/G	Microsoft	4
9 RAM Doubler	Connectix	11
10 Uninstaller v3.0	Microhelp	6
11 MS Office Pro 4.3	Microsoft	7
12 PlanIt Business Plan 2	RMG	12
13 MS Office 95 v7.0 U/G CD	Microsoft	9
14 Sidekick 95 for Win95	Starfish	8
15 Visio 4	Visio	-
16 Dr Sol Anti Virus Quarterly	S&S Int	20
17 MS Works	Microsoft	5
18 Quickbooks v3.0	Intuit	-
19 Passport Lan Licence	Lotus	-
20 CorelDraw 5 to 6 U/G CD	Corel	14
Figures supplied by Software Warehouse and relate to bestsellers for October 1995.		

Central station

Tim Bajarin on the prospect of a central information server ruling a world of low-end access terminals.

Three years ago, I wrote that the mainframe was not a dinosaur and would make a significant comeback. I saw mainframes and minis as critical for delivering multimedia content to PCs and TVs, both as a glorified server and to handle some of the processing tasks. The internet was just starting to gain attention at the time, but mostly as a tool for business and educational research.

Diagrams that various interactive TV vendors were working on tended to envisage processing being carried out at the server, because the home access device had to be cheap. I was inclined to agree with this perspective.

Little did I, or anyone else in the PC industry, know at the time that this model would flourish on the internet, acting as a global network providing access to content and applications. Now the battle is on to determine the standards that will be used in access devices, and the roles Intel and Microsoft will play.

The likes of Oracle and Sun Microsystems believe that the network is the computer, and should be independent of the chip and operating system used by the access device. They propose that the standards should be inherent in the internet, or in the network itself.

This means that internet protocols like ftp, HTML, browsers, viewers, security and filters are what really matter. Multiple digital access devices will be crucial in getting information, and they should not be tied to a single chip or operating system.

You could, for example, access the internet from the office via either a PC or a TV in the living room, or a portable dedicated terminal in the kitchen. Of course, the smart phone could reside anywhere and have its own

operating system as well.

This argument will become more powerful once Sun and its partners release their new computing model in a few months' time. They go as far as proposing that the industry immediately begin developing low-end access terminals. Sun co-founder Bill Joy spends most of his time creating a reference model for a Sun internet access device costing around \$200.

This is, of course, full circle back to the days when the mainframe ruled a world of dumb terminals. However, most of this digital access will take place via a PC, which is anything but dumb and indeed, will become more powerful. Moreover, adding a model of high-bandwidth connectivity to this scenario, will provide access to vast amounts of data, information and applications — a "computing nirvana" that few would have predicted a year ago.

The interactive TV scenario is less clear. Most

set-top boxes now are truly dumb terminals (or have little processing power), so the interactive entertainment model is likely to have most processing carried out at the server end. Low-cost dumb internet terminals may also end up in areas where data access rather than productivity is the issue.

Within this new view, Intel and Microsoft could be threatened in the future. In a dispersed global network, where standards are driven by internet access, Intel x86 chips and Windows could hit a few roadblocks. Backwards compatibility will continue to be an issue that they can push over time, but within a global network its importance is likely to diminish.

Both Intel and Microsoft remain winners in the short term. But once the internet backbone carries applications as well as data, and allows platform-independent access, they could face serious challenges.



Hollowed ground

The house which billionaire Bill Gates is building for his new bride nestles in a hollowed-out cliff on the shores of Lake Washington, a few miles from Microsoft's Redmond campus.

It is not a normal house. The entry hall will have a ceiling-high video wall displaying digital art. The dining room will seat 300 people. The garage will be able to house up to 20 cars.

A PR agency in Washington is publishing, on its web page, a weekly update on how the work is progressing: so point your browser at www.morsepr.com.



ANALYSIS

The year of Windows 95

Clive Akass takes a look back at an eventful 1995, the good, the bad and the absurdity.



This image by Brian Cooke, electronically manipulated by Leana Newlyn at Visualeyes, shows true photographic quality from a Fujix Pictography 3000 digital printer, which will set you back £13,000

ANALYSIS

The PC world of 1995 was inevitably dominated by Microsoft's new operating system. Windows 95 was the biggest software event for five years (since the launch of Windows 3.0, the first successful version). It generated billions of dollars' worth of business and one way or another affected, or will affect, tens of millions of users.

But it was an event of scale rather than substance. Win95, which should have been Win94 or even Win93, was old hat by the time it came out, and contained little that could not be seen in rival OS/2 Warp or Mac OS.

What made it different was the fact that when Microsoft moves, the world moves with it. With Win95, the mainstream computing world changed gear from 16-bit to 32-bit operation.

Win95 retains many 16-bit byways for backwards compatibility, and is dismissed as a botch-up even by Microsoft insiders. The operating system of the future it isn't; but with its promise of much better to come, and its demonstration of Microsoft's near absolute domination of PC software, it epitomised computing in 1995.

It was the year we began to take processor power for granted. The humblest entry-level 486 machine had more than enough punch for routine applications. Processors nevertheless continued to get faster, with Intel's Pentium clocking up to 133MHz and the latest Pentium Pro coming in at 150MHz. Just as important was the introduction of fast (up to 120MHz) Pentiums operating internally at a battery-friendly 2.9v, making

them suitable for portables.

Intel still dominates, but its position looks less secure than Microsoft's. PC vendors increasingly look to chip cloners like Cyrix and AMD to reduce their dependence on Intel supplies. Microsoft itself is loosening Intel's grip by encouraging the use of rival hardware to run Windows NT. The PowerPC is not yet a big threat, but its importance may grow.

The high price of memory chips provides perhaps the biggest brake on performance for most users, especially with the advent of Windows 95, which needs 16Mb to show its paces. But hard disks have got bigger and cheaper.

Iomega set the cat among the storage pigeons with its cheap Zip drive, which takes 100Mb removables, costing £15. Syquest countered with the 135Mb EZ-135; Iomega promptly announced a cheap 1Gb removable drive.

Prices of CD recorders fell by 50 percent, but with a starting price of around £800 they are still well above consumer level. Applications such as digital photography and desktop video editing have been marking time on the specialist sidelines, waiting only for all this cheap mass storage to let them enter the mainstream.

Low-cost colour printing also improved over the year. Budget machines have yet to reach photographic quality (though we are assured that will come) but they can outclass, say, early Technicolor.

In January, *Newsprint* predicted that 1995 would be the year of comms. The internet boom has indeed continued,

and only the diversity of telecoms law has prevented modems from becoming a fixture on PC motherboards.

Bandwidth remains the big disappointment. Modems can deliver nothing like the true potential of the web, but most of us still struggle along with them. Even the 128Kb/sec digital ISDN service is inadequate (and overpriced).

High-bandwidth links are not inherently expensive, and the problems of providing them are less technical than political. At the party conferences, however, there were signs that this was at last becoming an issue.

A BT demonstration of state-of-the-art videoconferencing inadvertently showed the absurdity of the situation. Even over an ISDN link, movement was jerky and voices were clipped. Most of the technical sophistication was in cramming information into the narrow bandwidth. It was like flying an exquisitely souped-up Sopwith Camel rather than Concorde.

Mobile computing entered a similar fairyland. Beautiful notebooks have appeared, powered by battery-friendly Pentiums, with all the multimedia gizmos and fine colour TFT screens more than 11in across. But they are walking desktops; too big for the road. True mobiles are evolving from the palmtop, and with an exciting move towards wireless communication.

This was part of a general trend by which PCs, TVs, telephones, cellphones and other appliances married and began to breed exotic new devices. Hence this year's buzzword: "convergence".

After three decades of breathtaking change, computing is changing faster than ever. We are seeing the future take shape before our eyes. As a *Newsprint* headline said in June: "Welcome to the 21st century."

● Review of the year, p144.

Chipping away at the market

If there's one thing that unites the factions in the chip war, it's collective fear, says **Simon Rockman**.

Everyone is scared of Intel at the moment. The chip giant is on its way to making \$100bn by the year 2000. Intel can afford to build billion-dollar manufacturing plants and invest in the fabulously expensive test equipment necessary to develop processors years into the future.

AMD's purchase of NexGen in the form of a share swap, which effectively values the company at \$800m, is a sensible response to this reality. AMD, NexGen and other chipmakers like Acer and Cyrix have made little impact on the Intel market, and the chips they have all been promising have failed to appear. The Cyrix M1 made the first silicon over a year ago and we've yet to see a real M1 machine, although the M1-based Blue Lighting 5x86 seems to be bubbling along quite nicely.

The most successful (or least *unsuccessful*) of the lot has been AMD which at least has an agreement with Compaq for the Pentium-class K5. Compaq wants to buy elsewhere because it feels that Intel is stealing all the glory. If machines are bought on the basis that they display an Intel Inside badge, there's little to distinguish between machine manufacturers. Compaq wants us to buy machines with — and for — the Compaq badge.

PC manufacturers receive considerable marketing support, and a discount on chips if they stick the Intel Inside stickers on their boxes. So Compaq is keen to support

AMD but K5 is running late. The only company with a Pentium rival actually available is NexGen. What is even more surprising is the fact that the NexGen Nx586 is one of the most advanced chips on the market.

In some ways, it's a great fit. The K5 is a superscalar chip design. The Pentium is like a V8 engine, made by bolting together two four-cylinder engines. The K5 makes a V16 by using four four-cylinder units — it's a good Pentium rival. The Nx586 is altogether more clever; it converts the 8086 instruction set into simpler RISC instructions and runs those. This is the technique used by the Pentium Pro. So, by buying NexGen, AMD already has its Pentium rival.

There is, however, the problem of IBM. While IBM is part of the club which wants to see the dominance of Intel waver, it is one of the backers of NexGen. Curiously, the original AMD press release announcing the NexGen purchase states that it has been approved by the major backers of NexGen including Compaq and Olivetti; IBM was not mentioned. And NexGen needs IBM: the complicated Nx586 can only be made using IBM's five-layer fabs. The three-layer system used by AMD's fab can't cope with the design. So now AMD has a chip, it has to buy from IBM. The only thing keeping this all cosy is the fear of Intel.

IBM has two other strategies with which to take on Andy "Intel" Grove. The first is

PowerPC. This has had fewer production problems than the Intel-compatible chips, and with NT implemented, it only needs a jolly good push by Microsoft and IBM (who are now friends again) to stack up. But IBM has chosen to relegate the PowerPC to the workstation division, which is pretty much terminal for the chip which has proved to be so good in the PowerMac.

The IBM workstation people licensed NeXTstep, the operating system which was years ahead of its rivals, and did nothing with it.

A more valuable tool with which IBM can attack Intel is Cyrix's M1. Under a deal with Cyrix, IBM can make one chip for itself for each one it makes for Cyrix; and with that special process the new M1rx is cheap enough to make it a real rival to Intel, so it seems likely that this is the weapon IBM will use.

The deal has a problem, though, because IBM seems to want to produce more chips than Cyrix wants. It could make them on the basis of buying the excess chips back from Cyrix, or it could buy Cyrix and save all the hassle. The lack of (non-IBM) machines with Cyrix chips seems to indicate that the company wouldn't be too expensive — at least, not in IBM terms. There were rumours of an IBM (or Samsung) purchase of Cyrix a while back, which might just have been Cyrix hyping the share price. Or they might have been true.



NexGen
rival:
Cyrix's
6x86 chip

ANALYSIS

Computations

When will climate change force motorists to chop back their cars, adapt them as breakfast nooks or fantasy double beds, and steer on a VR screen? The juice from a typical car plant, about 40 million watts, would drive more than 600,000 power-sipping PCs. Britain's 18 main vehicle assembly plants would power about 12 million energy-misers, and easily light up the UK's existing 4-5m conventional screens. The 24-hour online driving channels should include a jammed-up-in-the-rain option for those who find windscreen wipers sexy.

● **Powergen advertisement (Toyota's Burnatton plant)/Motor Industry Research Association/IDG Marketing Services**

The trade balance on computers is so negative that it means every Briton is sending about £33 to foreign infotech workers each year. The £1.74 billion-a-year cyber subsidy could pay for any one of the following:

- 1) The BBC
 - 2) All Tesco sales
 - 3) The rail subsidy
 - 4) 90 percent of the public science budget
 - 5) National lottery handouts
 - 6) All UK consumer books
 - 7) Eight new MI5 HQ's
 - 8) Nine Olympic stadiums
 - 9) 18 Arts Councils
 - 10) All computer games, twice over
- **CSO Annual Abstract of Statistics tables 12.3/12.4 (office machines and automatic data processing equipment; £416 trade deficit per household/annum in 1992)**



STATELLITE

One in every 33 CD-ROMs makes money, and they cost an average £325,000 to publish, meaning you begin to cover the odds only after a £10.7 million investment

● **Newsweek 5.29.95**

Even if you switch to a state-of-the-art energy-sipping PC configuration with a US "Blue Angel" stamp of environmental approval, your cred is still pulped by paper. A year's business supply of A4 paper (put at 40 cases) runs 50 percent higher than the environmental burden of your machine (assuming 300 watts at ten hours per day). American offices alone use a stack of paper more than 100,000 kilometres tall every year, which it would take an Airbus jetliner nearly five days to fly up.

● **IEE 1994 Environmental Conference on Computers p.299/Buzzworm 1993 Earth Journal/British Airways (cruising speed 530mph).**

STATELLITE

Japan buries or incinerates enough plastic in a year to load a nose-to-tail queue of semi-trailer trucks 2,900 kilometres long. The same level of waste for the Chinese would mean a 26,000-km jam

● **Canon Inc: Ecology, Towards Harmony between People and Nature, 1995/The Hutchinson Guide to the World, London 1995 (semi-trailer 23ft, 50ft)**

STATELLITE

Britons have half as many computers as Americans, and 134 times more than Indians.

Computers per 1,000 population in the USA: 265. In the UK: 134. In India: 1

● **Lester R Brown et al, State of the World 1994, Worldwatch Institute, Earthscan**

With the Smithsonian Institution reckoning that 75 percent of all US workers will be computerised by the year 2000, and the US labour force numbering 115 million, 86 million terminals can be expected in the US workplace within a few years. That scale of penetration for the expected 10 billion population in 2025 would mean more than 3.4 billion terminals worldwide. Installation so far has run at some 10 million PCs per year, at which rate the US level of penetration could not spread globally for another three and a half centuries. On the other hand, if Intel chairman Andy Grove is right in predicting that by 2000, PC sales will have surpassed 100 million units worldwide, more than the sale of cars or TVs, Americanisation would only take 40-odd years. The thing is, five-kilo plastic casings alone would require 185 supertanker loads of ABS plastic, causing 74 million tonnes of anti-climate gases.

● **The Smithsonian Magazine, May 94; also SIGCHI Bulletin Vol 27 No 1 (Jan 95), which predicts 80 percent/Information Please Almanac, NY, Houghton Mifflin/Newsweek 2.21.94/IEE 1994 Environmental Conference on Computers p.299/IEE Spectrum, January 95.**

STATELLITE

Britain fought World War 2 with fewer telephones than are now registered on the cellular network. Cellular registrations 1994: 3.503 million. Telephone stations 1937-38: 3 million

● **MarketLine/Whitaker's Almanack for 1939**

Now that the Intergovernmental Panel on Climatic Change has formally confirmed that the world is marinading in global-warming gases, it is worth reflecting that computers worldwide consume 240,000 million kilowatt hours of electricity per year, or all the juice used in Brazil. The annual power-cost of 170 million standard PCs could be halved by a mass switch to power-miser PCs, saving some 20 million tonnes of anti-climate gases. Unfortunately, the switch would cost, and it has been calculated that for every extra \$1 million spent producing electronic computers, nearly eight tonnes of polluting

emissions are generated, plus an energy increment of 42 billion BTUs — less than half that of fridges and freezers, but still climactically uncool.

● **The Independent on Sunday 9.15.95/Hutchinson Pocket Dictionary of the Environment, London 1994/DTI Brazil desk (Brazil's gigawatt capacity: 56,666)/PC Magazine (Siemens-Nixdorf Green PC (50 percent on 50 percent idle, 5.8-99.4w))/Compaq advertising campaign for DeskPro XL4/66 model /IEE 1994 Environmental Conference on Computers p.275**

Sounding Off



Michael Hewitt

The sort of people you normally meet in garden centres at weekends, pushing trolleys overloaded with plastic gnomes and battery-operated, integral-jacuzzi bird baths, are now turning up in Dixons and PC World, buying "internet ready" computers.

This suggests that the democratisation of the PC and, by extension, of the "information superhighway", is complete. Myself, I blame the software houses.

Just five years ago, everyday programs such as word processors and comms packages could reasonably be guaranteed to be completely unintelligible. Configuring them necessitated answering cryptic questions like "Recvd BS is dest?" and "NumLock toggle on?" The answer had to be a precise "Y" or "N". Anything vaguely multilateral — "Maybe", or "Let me think about it" — was totally unacceptable. As a result, only the anorak-afflicted really had any idea what they were doing.

Today, however, software manufacturers have made their programs far too easy. Consequently, just as Stork Margarine spreads straight from the fridge, so PCs now work straight from the box. Which means that our hitherto exclusive hi-tech turf risks being invaded by the hoi polloi.

Fortunately, one group — computer peripherals manufacturers — is still doing its bit to stem the tide of the Great Unwashed. Their products, including sound cards, modems and printers, incorporate cunning design features guaranteed to stump the technovirgin. I refer, of course, to DIP switches and their siblings, jumper settings.

Let's assume, for instance, that your average oik wants to change the paper size on his printer from US Letter (which, helpfully for those of us in Europe, is often the default setting) to European A4. Now, you could fix a simple knob on to the side of the machine that would do the job. But, thankfully, alert to the risks of making things this easy, the manufacturers

have instead assigned this function to a couple of banks of very fiddly little plastic switches — DIP Switches — usually hidden away in an extremely inaccessible part of the printer. Therefore, not only does the oik have to take his printer apart to find them, he then has to figure out what the hell to do with them. And what if he makes a mistake? We all know, for example, that inadvertently setting switch 8 of Bank B to "down" on an HP DeskJet = DTR & Xon/Xoff, but I'll bet he doesn't. What a jerk.

My favourite peripheral in this respect, however, has got to be the internal modem with its jumper settings, IRQs, and all the rest. In the buff, the thing looks intimidating enough, as if you are likely to need a degree in electrical engineering just to remove it from its static-proof bag. But for the tyro, the fun really starts when he plugs it in and then fires up the PC. (That's assuming he can get the case off the computer in the first place.)

Take my pleb-proof Zoltrix FM-144ATI (and I'm sure the following is equally true of others). By default, it's set to COM2. This means that, as is, it's guaranteed to conflict with the existing COM port in the PC. A good piece of design there, Zoltrix, which must fool many non-technical people. What happens, though, if technonewbie eventually works out what's gone wrong, takes the PC apart once more, fiddles around with the jumpers using a set of tweezers, and finally manages to set them to read as COM3? Fortunately, all is not lost. When he puts everything together again and restarts the PC, the IRQ setting of the mouse in COM1 will conflict with the modem's default IRQ at COM3. So his comms package will just sit there and do nothing, or, like a

downmarket pub, declare "Port Unavailable". Nice one.

Anyway, keep up the good work, peripheral manufacturers. We'll see off the bastards yet, and maintain the exclusivity of computer ownership.

I see that computers have been featuring rather heavily in the cinema of late, what with Sandra Bullock's identity being scrambled by one in *The Net*, and Steven Seagal using a Newton to help save the world in *Under Siege 2*. But in particular, a film called *Assassins* quite intrigued me.

Starring Sylvester Stallone and Antonio Banderas, *Assassins* is the story of a couple of hitmen who keep trying to knock each other, and others, off. They receive their instructions for each hit over a modem link. Both of them are equipped with identical Apple PowerBooks, which suggests that the 540 is the laptop of choice for discerning contract killers.

Anyhow, the big mystery of the film revolves around who their employer actually is, given that all they ever see of him is typed instructions appearing on their screens. What's the problem, though? The thing is, he isn't an anonymous internet site or an untraceable pseudonym on something like CompuServe. The mystery would then be understandable. But Stallone and Banderas' comms software actually dials him directly each time. So why didn't they just look him up in the phone book? Or was that too obvious?

As I look out of my window, I see the sun beating down and a heat haze rising in the distance. The temperature is probably in the mid-70s. All of which means that this column must be destined for the Christmas-cum-New Year issue of PCW. Season's Greetings, therefore, to you all. Have a good one. ■

Homefront



Tim Nott

What to do with obsolete equipment? Those of us pre-occupied by this housekeeping dilemma don't appreciate how lucky we really are, as my man in Accra points out.

Last September I wrote about the problems of what to do with hardware and software that was too old to be of further use, but too good to throw away, and speculated that I'd have to continue finding shelf space for it until a museum or burglar took it off my hands. In December's issue (p229) a cartoon by Larry showed phased-out computers being dumped at sea, by a ship named the "Spirit of Obsolescence". Goodness me, it's a hard life at the forefront of technology, but at least we're all able to retain a sense of humour.

It took a reader in Ghana to spoil both these rather weak jokes with a refreshing blast of reality. Romanou Macauley wrote from Accra a letter that was charming, cheering and chastening, and I make no apology for reproducing most of it here:

"I read with delight your article in the September issue of PCW because I've at last found the answer to my longings. You see, I've been reading PCW every month from the local library. And whenever I see the glossy adverts in the magazine I always wonder when and how I'll get enough money to own a computer and its accessories. I think the day has come for you to get rid of all that junk. You certainly don't need a burglar. No, not at all! What you need is a kind friend and computer enthusiast who needs those obsolete items. I understand that you can't bear to throw them away. You've taken the right decision. I mean, will you bin something that could make someone else happy? Of course not! So please faites-moi plaisir. Send them to me. I'll pay the postage.

"For some of us feeling our way into the computer world, freebies or low-cost second-hand computer hardware, software and magazines (English or French) are our best bet yet. If you know of someone who hoards obsolete (or otherwise) systems in his attic, and would like to get rid of them, please kindly give him my address. I and people around me will appreciate your generosity — I can already see myself spending hours glued to a computer."

Well, readers, how about it? Would all that old kit be better off in the attic, at the bottom of the sea, or in the hands of Romanou Macauley and people like him? Could that old 286 motherboard or 16-colour display card come out of retirement to make a further contribution to computing society? Could that copy of WordPerfect 3.0 flex its lexical muscles once again? And would the knowledge that this was happening give you a sense of righteous satisfaction?

If so, please don't send your old kit to me or to PCW. If you want to send it to Romanou at P.O. Box 2014, Accra Central, I'm sure he'd be delighted and grateful, but I think we can afford to be rather more ambitious about this. I've no desire to re-invent the wheel, so if anyone reading this is already involved in recycling redundant kit for good causes — either in this country or abroad — please write to me at PCW or by email to timn@cix.compulink.co.uk.

I'll compile a list of charities for a future column, but if you don't want to wait, and have surplus items that you want to pass on, write or email with

details — again don't send the items themselves — and I'll try my best to put you in touch with a suitable organisation.

And now for something completely different:

Here's a tip for all you manufacturers who want to foster the idea that computers are lovable, cuddly things that are just right to have in the home alongside — or even instead of — the telly: smarten up the back. Many people are ready to be seduced by shop-window displays of svelte multimedia desktop dream machines.

The only trouble is that the PCs they've actually seen in use — on the desks of insurance brokers, travel agents and so on — are facing away from them and present the unacceptable rear-end of technology. A mass of slots, ports, plugs and sockets festooned with skeins of assorted cable belies the "You too" approach of contemporary advertising.

Sceptical technophobes might concede that plug and play sounds a great idea, but where exactly does one plug? And with what? I don't want to boast, but I've got fourteen assorted connectors on the back of my PC. Four aren't even connected to anything, so goodness knows what they do — maybe I'm missing out on something.

If manufacturers want to make PCs more palatable, hide all this stuff. Infra-red connections wherever possible, please, and the rest neatly hidden behind a hinged panel with colour-coded guides to keep the cables in order.



Straight Talking



Barry Fox

If you own a Compaq Prolinea 386 or 486, or a Presario 600 or Minitower PC, you may want to cut out and keep this month's column for future insurance. I have had to squeeze out this story like blood from a stone, or getting US Robotics to admit that its 28,880 Sportster modems had faulty chips.

It all began when I discovered by chance that Compaq had fitted faulty CMOS backup batteries to its ProLinea 386 range. By a remarkable coincidence, my wife had been one of the few people in the universe Compaq hadn't contacted "proactively" to offer a free replacement.

The signs are unmistakable. The PC develops Alzheimer's — losing date and time when it is switched off. An error message appears on the screen when it's next switched on. This is your last warning of imminent catastrophe — within a few weeks the CMOS loses the system setup as well as date and time, so that the PC can't find its own disk drives and refuses to boot up.

Optional Rescue — running the setup program stored in the ROM chips to rebuild lost settings — is easy when you know how, but like talking Martian if you've bought a PC for office use, as most Compaq customers do.

As detailed in a previous column (PCW October 95) Compaq admitted to me that the CMOS batteries used in the ProLinea range between November 1992 and March 1993 had been faulty. David Moore, then Senior Product Manager at Compaq (now with Dell), claimed Compaq had extended the warranty on these batteries from three to four years to protect customers. Moore wanted me to believe that failure to offer free warranty replacement had been an "exception".

Checking out the free warranty promise exposed further the yawning gap between Compaq's publicity promises and reality for the consumer.

The original battery had failed a few days after the PC was bought and the dealer sent an engineer to "replace" it. We now know that the faulty NiCad was left on the motherboard, with a new battery stuck to the chassis alongside.

A little over a year later, I asked my dealer to order the replacement-for-the-replacement under the promised warranty, for DIY fitting.

The replacement arrived a month down the line but the dealer couldn't supply it to me unless I first gave him the dud. During the wait for the spare battery to arrive, the fault had long progressed to the terminal "refusal to bootup" stage.

Fitting the replacement battery cured the problem, but uncovered something very nasty. Although the original on-board faulties were NiCads, the off-board replacements aren't rechargables. They aren't even long life lithium cells but alkaline cells (Rayovac 480, 4.5 volts), comparable to Duracell torch batteries. So it seemed hardly surprising that a replacement for a faulty NiCad was itself failing after a year or so.

Compaq is surprised. It expects the alkaline cells to last "three to five years". But — wait for it — the company now admits there was another fault in some ProLineas.

James Griffiths, Product Manager for Commercial Desktops, confirms that: "In some instances the ProLinea system board continued to try and charge this external battery and therefore reduced its life...in these cases

the system board was replaced free of charge."

A serial number check confirmed that our ProLinea was not one of the faulty batch. Other checks confirmed that the board was not pumping significant reverse charge into the alkaline battery and that jumper leads for the first replacement were set correctly.

All this points to a common-sense conclusion — putting alkaline CMOS batteries in a PC condemns it to imminent failure. The instructions with the alkaline batteries refer to a wide range of Compaq PCs (Prolinea 386/486, Presario 600 and Minitowers), so all these models appear to be at risk.

On 11th September, I asked Compaq for reassurance for customers. By 1st October, I was pushing for an attributable comment from Compaq's Managing Director on my fear that "everything points to a ticking source of failure inside large numbers of Compaq's PCs". Despite promises, I had still received no comment after four weeks. Draw your own conclusions. Mine is that if Compaq and others are saving money by using alkaline batteries instead of NiCads or lithiums for CMOS backup, customers will end up paying for this "economy".

While all this was going on, I went to Paris for IDG's European Information Technology Forum. Speakers relied on electronic "slides", stored in a PC and projected by a video system. But several speakers had technical difficulties — slides either refused to change, or changed too early.

When Andreas Barth, Senior Vice President of Compaq, took the stand, he announced that in order to save embarrassment he was going to use an Apple Mac to show his slides. There may be a moral here. ■

Business Matters



Nick Beard

We are now installing the "client/server" version of our clinical workstation. This is the PC-based version of PowerChart, a tool which enables doctors and other clinical staff to work with electronic medical records.

The system, part of our hospital application suite from Kansas City's Cerner Corporation (UK office in Luton) was already client/server in one sense; it is simply that the client and most of the server ran on the VAX — the only distributed part of the client software was the X-Windows piece which sat on the PC. This, however, makes the transition to client code which uses the PC much easier.

But is the client/server architecture simply a workstation on the route back to a more mainframe style of computing systems delivery? Many vendors are spending a fortune re-engineering their product lines to produce "client/server" versions of their products. This *might* make sense, but it doesn't necessarily follow that it will. Many software customers are engaged in the wholesale migration of their corporate applications suite to a client/server model. What is the driving force behind these moves, and have the motives always been properly thought through?

One view is that development of the computer, like every other industry, is driven by economics. First, the mainframe. Expensive. Then, the PC. Cheap—*er*. Since PCs became cheap, and graphical user interfaces became mandatory, the costs of computing power and of network bandwidth made it impossible to run many business applications on anything but PCs. When PCs were introduced, mainframes were rendered incapable of economically providing services such as spreadsheets. The number of cycles

required to churn out graphics, even in DOS mode, were unaffordable. On top of the limitations of mainframe application appearance, software development times were usually long. How could the expensive data centre compete with the mass-market price structures of "garage" software; software which (supposedly) enabled the user to do more themselves?

The *Standard Interpretation*, the most popular view of recent computing history, is a large part economics flavoured with a dash of nonsense about "user empowerment". Like many *econocentric* tales, it assumes that decision makers are rational and in possession of all the relevant facts. PCs, the *Standard Interpretation* goes, prompted the restructuring of corporate systems to enable lithe corporations to exploit the pace of development of silicon chips (one thing is indisputable: in the cost of raw MIPS, expressed as \$/MIP, PCs have outstripped mainframes for years).

The fall of networking costs just helped things along (or if you like, the need for networking in the aftermath of indiscriminate PC buying, bulked up the market and engendered volume discounts). This is not to suggest that these developments were necessarily a *bad* thing. However, there is another view. In the *Alternative Interpretation*, the PC/networking response to corporate computing is not *always* a rational exploitation of cheap MIPS and the falling cost of bandwidth. What was missed out? Consider the pieces from which computers are built. In essence,

all computing systems (at present), whether massive monolithic mainframes, networked minis, micros or standalone laptops, require certain constants: computing engines (CPUs), storage, screens/keyboards, the wires which connect them, and *the software they run*. The *Standard Interpretation* fails to take account of the *cost of software development*.

As noted earlier, mainframe application development times were usually far longer than the software built by users themselves. The problem with home-grown software is that it may be constructed in an undisciplined fashion. Every department, indulging in a frenzy of "user empowerment", did its own thing. The cost of consolidation soared. How do you create cross-corporate reports when one department has poured data into a database using months 1,2,3,4,5; another has organised its records by Q1, Q2, Q3; and the next by Jan, Feb, March? Of course, these data-merging problems are not new, nor are they completely insurmountable. They do, however, represent the hidden cost of badly organised "user empowerment". Mainframe application development cycles tended to be even longer than home-grown efforts because of the development disciplines that professional data centres demand.

The jury is still out on whether client/server computing protects companies from these problems. Client/server styles will continue to be developed and deployed, and if done for the right reasons will continue to bring benefits. However, companies should be cautious about expecting cost reductions and rapid software development times. The business case must be built carefully. ■

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Letters

Don't believe the hype

Tim Nott's statement (*Homefront*, PCW December, p41) that Dvorak "lifted" material from Negro spirituals for his New World symphony is completely false. In a letter to his publisher, Dvorak wrote that the story that the work contains Red Indian and Negro music was an advertising stunt designed to promote ticket sales for his subscription concerts. In 1890 he wrote to the conductor Oscar Nedball, who was preparing programme notes: "But the nonsense — that I made use of 'Indian' and American motives — leave out, because it is a lie...".

After over a century of massive, desperate efforts to find any connection between Dvorak's work and Negro/Indian material, the only thing to have turned up is a fragment — less than a dozen notes of a Red Indian melody he asked his friend Kovarik to note down, which bears a *slight* resemblance to just two bars of his E-flat quintet.

The interesting point is that it shows that advertising hype is so powerful, it is still believed a hundred years later.

NRD Griffith, Kent

The PC as a tax dodge

I was amused to read the item "The PC Goes Home" in the *News Analysis* section of November's PCW.

What is particularly droll is

your comment that "nearly seven out of ten of the efficient Germans put their PCs into a home office".

I rather think that the truth has less to do with the (largely mythical) efficiency of our Teutonic cousins, than with the fact that substantial income tax relief in Germany

is (or was until this year) available if one room in a flat or house is designated as an "office", and can be shown to be used as such. This is irrespective of whether the taxpayer normally works there or in a workplace provided by his or her employer.

What better way of "proving" to the tax authorities that the room is actually an office, and not, say, a living room, than installing a PC?

Otherwise, full marks for the changes in magazine layout and for continuing to provide something worth reading every month.

**Norman D Griffiths
Neu-Isenburg, Germany**

Intel test unreliable

How many Intel Pentium users have tried the current "Intel Test" and found that it has failed to identify their

Pentium as faulty?

A long time ago I tried Cleve Moler's test (PCW February, p294) which confirmed that I had a faulty Pentium. In August, I contacted Intel on their "Pentium Processor Help Line" (0800 374838) about a replacement. I was asked to carry out a different "Intel Test", and was told it was the only test Intel would now accept. The test is shown below:

$$X = 1 \times \frac{824633702441}{824633702441}$$

processor is OK if $X = 1$

The test failed to show that my Pentium was faulty. Unfortunately, the "Help Line" team would only arrange for the replacement of faulty processors identified using the Intel test. Having already used

erly, runs on the machine it was developed for and does at least what it says on the box. The term "minimum requirements" is particularly misleading, giving little impression of what the program is like in real life and forcing users to abandon the new software or "invest" in new hardware. The trouble (as well as the beauty) of PCs is that they can be made up of so many different components (such as graphics accelerators), that it is impossible to recommend any one spec. If a user experiences difficulty in running the new software or if it conflicts with existing software, they have every right to complain and pester the "helplines" until the problem is sorted out.

I don't want Win95 on my machine — having seen it on other PCs I think it's dreadful — but I guess I'll end up installing sooner rather than later. I teach IT, mainly to beginners who are particularly likely to be suckered into buying and having problems with this "indispensable" new system. I'll therefore need to make sure that I'm up to date enough about the ins and outs

of Win95, as well as becoming au fait with the various hardware requirements of my students' minimum spec machines. Still, it's all helping my business, so I can't chastise the Bill Gateses of this world too much, now can I?

All this is really a shame, because I'd plump for a revamped Windows NT, especially if it sported something similar to Win95's rather nice interface and was a good games platform. But then I'd really have my work cut out.

**Mykel Evangelista
Lancashire**

...or the road to upgrade hell

Many thanks to Tim Nott (*Homefront*, November) for stating the basic problem for the serious user upgrading to Windows 95. He rightly pointed out that to get any benefit at all from the new system, it is necessary to upgrade all existing software to new 32-bit versions.

Quite simply, Microsoft (and others) will make a killing from charging more than £250 to upgrade Office from version 4.3 to Office 95. If there were any

Cleve Moler's test, I was completely unsatisfied with this. I was told that the only thing I could do was to call Intel's UK office. They initially tried to fob me off, saying only their test could be accepted and that the fault was not significant. I persisted, and in the end they sent me their CPU identification utility disc. This confirmed that my Pentium was one of the faulty batch. Things went smoothly after that and I have since installed my replacement Pentium.

What is Intel up to? Clearly their calculation test does not always work: I wonder how often it does. Do they only treat personal users in this way or do business customers get the same treatment? Perhaps you could warn other users about the shortcomings of the Intel test through the columns of PCW, and tell

real benefits to be had from the upgrade, this might be acceptable. But on all counts version 95 has nothing to offer over 4.3, except those features common to Windows 95 itself, such as long filenames.

The only other feature of Windows 95 that will be of benefit to the professional user is the expansion of system resources, allowing more than Word or Excel to be run at one time. Multi-threading seems like a good idea, but on a Pentium 90 or higher, printing and similar tasks are done so quickly that there is no need for true multi-tasking. Meanwhile, software such as RamDoubler has appeared, overcoming the system resource problem and making Windows 3.11 more stable.

As a user of Office 4.3, RamDoubler and PC Tools for Windows, I'm afraid that I will not be adding to Bill Gates' millions when the only tangible benefits of the new Windows 95 can be duplicated without the additional expense of upgrading every software package I have.

**Andy Hann
Milton Keynes**

them that if they are not satisfied, they must insist that Intel sends them the CPU identification utility.

**Hugh Nisbet
Co. Down**

One for the ladies

In the course of writing my book, *How To Make Money From Your Personal Computer*, I was struck by the number of self-employed women who use computers to earn a living.

It seems to be taken as read that men are masters of the computer world. Yet using computers at home is ideal for women. Firstly, It enables them to adapt their working hours to their children or elderly relatives (and we should be asking why it is still women who take on the bulk of these tasks). Secondly, it gives them access to a world of people via the internet and email, and, with suitable training, takes them away from the stereotype of home typing for a living. I have spoken to women designing press handouts, creating a biannual directory and editing and disseminating a financial bulletin, to name just a few.

There is an under-appreciated world of women working with computers in their own homes — teleworking does not adequately describe it. I hope your magazine will be giving more coverage to woman-friendly articles, explaining what the latest computers can do for them.

**Polly Bird, Cheshire:
author of *How to Earn Money from Your Personal Computer***

Osborne offer

Simon Rockman's look back at the Osborne 01, the world's first portable computer, must have brought a tear of nostalgia to many an eye. This ageing classic is great fun to play with, especially for the retro-buff or computer historian, and I have had many happy hours tinkering with the one

that lurks in the corner of my office.

Unfortunately, I now don't have space to house the creature, so I would like to offer an example of the world's first portable computer, free of charge, to any bona fide museum or organisation that would value it.

Neil Harris
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Note on Notino

I found Ben Tisdall's review of the Hi-Grade Notino and Gateway Solo multimedia notebooks unusual. Consider the following:

Design: Apparently, the main things he liked about the Solo were its neatness and lightness. "Partly because it has a CD or floppy drive, rather than both, the case is more compact," he wrote. The lack of a floppy disk drive is actually a serious disadvantage. It would, for example, be difficult to install Windows 95 from a CD to a computer without having a floppy to boot from.

Value: Going by current advertising, the Gateway Solo S120 Deluxe costs £3,999 plus VAT. You can buy the Notino Mover with the same processor, with full multimedia capability, a TFT screen and a 1.2Gb hard disk, for £3,150 plus VAT.

Maybe the reviewer finds it difficult to put himself in the shoes of an ordinary customer who has to pay for their choice and make a long-term decision, rather than move on to the next review machine.

Ori Yiassoumis
Sales Director
Hi-Grade Computers plc

Ben Tisdall replies:

Although your point about installing operating systems is a good one, what I'm

hearing from notebook users is that floppy disk drives are being used less and less often. Data is more likely to be transferred using a modem or by hooking up to a company network.

Money can't buy me love

I recently received a copy of Microsoft Money for Windows 95. As a user of version 3.0 of the product, I was keen to upgrade as I had assumed that Microsoft would take the opportunity to close the feature gap between Money and Quicken. However, the new version of Money has no new features and is merely version 3.0 with a tarted-up interface (which is very un-Windows). Selling the new version for £12 seems to be a cynical attempt to grab Intuit's market share by selling a vastly inferior product at a rock-bottom price. A message to any users of version 3.0 of Money — do yourself a favour and don't bother wasting money on an upgrade. From now on, I'll be using Quicken.

Julian Warr
jwarr@dial.pipex.com

PCW replies:

Microsoft liked Quicken so much, it attempted to buy Intuit. Unfortunately for Microsoft, the acquisition was blocked. It will take them a while to close the gap on Quicken, and frankly it's a relief to most people to find one mainstream PC application area that Microsoft doesn't own.

Virus vanquishing

I am not sure that these so-called "Macro Viruses" need to be such a threat. It has to be remembered that any command has to be executed by the word processor application. It must be a trivial matter for the developer of the word processor to release an additional facility which disallows the execution of programs or commands on

the loading of a document, if they have not been previously registered as a safe command. This would effectively lock out the virus for good and stop it spreading.

Dino Dini
dino@ujuga.dungeon.com

Not HP

Barry Fox (*Straight Talking*, December 1995) is not very impressed with HP's attitude towards customers. Neither am I. I have a DeskJet 500, which used to work fine with Windows 3.1 and Word 2.0a. Then I "upgraded" to Windows 95 and found I couldn't print envelopes any more. Microsoft say this is HP's fault (because the Win95 driver isn't as good as the Windows 3.1 driver) and that I should contact HP for a fixed driver, but the chatter on CompuServe makes it quite clear that HP have no intention of ever producing a Windows 95 driver for the DeskJet 5xx. And nobody, not even Microsoft, can tell me how to back up to the Windows 3.1 driver that worked fine. HP's BBS number was engaged four evenings on the trot, so I have given up trying it.

While I might appear to HP as a worthless customer, as I only use an "ancient" DJ500 (less than three years old and still working fine) at home, I do specify which laser printers my department buys at work. As we are about to buy a new, large printer for the department, should I buy HP, with the expectation that when a new version of an operating system (Cairo?) comes out I am expected to throw it in the skip? Or do HP, as it seems, really want me to buy from someone else.

Tim Ward, Cambridge

Retail, not mail

I regularly read your group tests but am regularly disappointed to see the number of the machines reviewed which are not available in retail outlets. It's not surprising that

people are wary of spending £1,500 plus on a machine they've never seen and probably haven't read a review of, especially when you consider that everyone knows at least one person who can tell a mail order horror story. I would like to see a specific group test on machines available widely in retail outlets, brands such as Packard Bell, Apricot, Vanilla, Escom, Highscreen, or Compaq.

I read your review of PC/TVs in the December issue and was disappointed to see the number of inaccuracies in some of the machine reviews. A good example is the Spectria review which starts by stating that it has an integral 15in monitor when it is 14in, the CD-ROM is quad-speed, and I believe the original price when released was around £1449+VAT but is now £1149+VAT. I have found that people buying Packard Bell computers find the colour-coded connectors very helpful, especially since PS2 mouse and keyboard connectors are practically identical. All of this is irrelevant anyway, as the model is discontinued — the 95xx range has been replaced by the 9xx range.

The PC/TVs you reviewed are/were available from a single shop, PC World, and the others individually from Tempo and such-like. In the run-up to Christmas and the January sales, I believe the majority of PC buyers will be buying from retail outlets, and I would like to see group tests which reflect this.

Joel Mansford, London

Board rigid?

Ian Pluthero [of Gateway 2000] sounds a little too complacent in his reply to RV Geal (*Letters*, December). I recently wanted to add 4Mb to my 8Mb P75. After interminable calls through to Gateway sales (with several repetitions of my customer ID number), the salesman told that me the memory for the P75 only



came on 8Mb boards. Naively, I bit the bullet.

Two weeks later, after many frustrating chase-up calls, two 4Mb boards arrived, taking my last available memory slots. Mr Pluthero won't know about this as I am not prepared to spend the time taking them out, returning them to Gateway and having to chase up the 8Mb board replacement.

On a more positive note, it's been a great machine.

Duncan Goldie-Scot
duncan@live.co.uk

Licence loophole

In the company I work for, we have a corporate policy not to use an operating system without a virus checker based on

the PCs and on the servers. Our current virus checker has versions for DOS, Windows 3.11 and Windows NT, but the Windows 95 version is being developed.

We purchase PCs direct from a manufacturer who will preload either Windows 3.11 or Windows 95 for us, but not both. In the period of a few months, until the Windows 95 virus checker becomes available, we are forced to buy two licences for Microsoft Windows. Microsoft have very sweetly told us they are different products, and that we cannot therefore use Windows 3.11 under the Windows 95 licence.

Our company tries hard to be rigorous in using only

licensed software, and will therefore pay the extra £50 or so for each upgrade. But how can software companies expect users to abide by licensing agreements when

they treat them [the users] with such undisguised contempt?

Adrian Pope
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Hindsight

Ten years ago: January 1986
Report from Comdex, Las Vegas

"If there was a Comdex trend in add-ons — apart from the obvious ones that all roads lead to the IBM PC — it was disk cards. Plus Developments started the trend with the HardCard, a 10Mb, 3.5in Winchester disk drive built onto a standard PC add-on board and announced some months back... All these manufacturers were pushing ease of installation and easy removal for data transfer from one machine to another."

Update: Comdex, at least, still happens in Las Vegas every November. See Newsprint, pp18-30.

Five years ago: January 1991

"A year ago, Lotus didn't sell a word processor and WordPerfect didn't sell a spreadsheet. So they got together and said: 'Microsoft sells both, and claims they work together. Let's make ours work together' — and Lotus 1-2-3/G and WordPerfect for OS/2 Presentation manager began to be born..."

Update: Developing for OS/2 was a disastrous mistake for both companies. Both were late with their Windows versions. Both companies were later bought, and their respective spreadsheets and word processors now have to content themselves with picking up the crumbs under Microsoft's table.



Honcho head-hunt

My compliments to your letters page editor for bothering to get a reply to a reader's complaint about Gateway 2000 from their MD, Ian Pluthero. (*Computer Shopper* recently published a similar complaint letter from another Gateway customer with no response.) I had a minor problem with my recent order to Gateway. Some software that was supposed to come with it, didn't. I phoned several times and wrote a letter. After a month there was still no

response. Now, having Mr. Pluthero's name, I was able to write to him. Right away I got a phone call, a polite letter, and the disk delivered by carrier. It might make an interesting little feature sometime to publish (for sending bouquets as well as brick-bats) the names of the head honcho in the UK for many leading hardware, software and mail order companies.

Stephen Wells
stephen_wells@msn.com

First Impressions



First Impressions includes the irresistible "Gadgets" spread on page 56. Highlights include a pair of bargain CD writing packages; each priced at under £1,000. And there's HP's hybrid palmtop. If you're feeling frisky, load up The National Lottery, or get ready to Map'n'GO.

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VNU European Labs

VNU Labs tests cover every kind of hardware and software including PC hardware, printers, network products, modems and software applications. The tests are continually developed

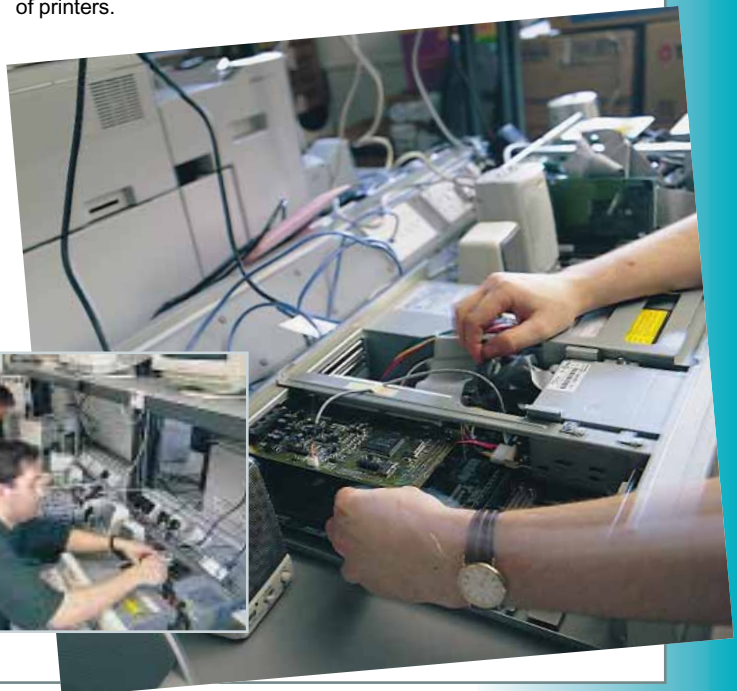
and enhanced to reflect hardware and software developments.

Our tests closely simulate real-world use. For example, the suite of PC hardware benchmarks uses complete versions of industry-standard applications like Microsoft Excel and Word for Windows, WordPerfect 6.0 (DOS and Windows), Lotus 1-2-3 version 3.4 (DOS) and FoxPro (Windows and DOS).

Application tests are the backbone of all the VNU Labs system evaluations but it's nearly impossible to pin an application result to a specific machine component. Only system-level tests (also known as low-level tests) can reliably tell the difference. VNU Labs' system-level test suite is called Euromark. The tests, which are mainly Windows-based, quickly size up a hard disk, sound card, motherboard, display adaptor and printer, and give individual and overall figures.

● To make them easy to read at a glance, all the graphs in PCW are now drawn so that the bigger the bar, the better the result. Normally we'll also include the original data we worked from: for example, the

time in minutes and seconds to print a page in a comparative test of printers.



HARDWARE

Hewlett-Packard OmniGo 100

Despite the OmniGo 100's clever hybrid pen and keyboard design, PJ Fisher doesn't think it's going to de-throne Psion.

The new Hewlett-Packard OmniGo 100 has a surprise in store. Before you open it up it looks like a normal palmtop. Then you discover the screen folds right back on a double-jointed hinge to lie flat on top of the keyboard unit. Lying in a slot at the front there's a little Newton-style pen. By now you are definitely aware that you are in possession of a very different palmtop, one that gives you a choice of interaction.

So which method should you use — pen using Graffiti software

determine whether you could get used to this keyboard.

But the OmniGo 100 is likely to be marketed on the back of its hybrid pen computing tools as much as anything else. Next question then: How well does it recognise handwriting? Very well, since the OmniGo has foregone any Newton-style recognition pretence and gone for the reliable Graffiti software instead. As long as you follow the rules every character you scribble on screen will be recognised instantly. HP claim that the Graffiti language can be picked up in twenty minutes and this seems realistic based on my experience.

I felt comfortable with Graffiti. But is single character entry the best way to take notes? I would need more time with the OmniGo to be convinced that it could beat fast keyboard entry, something the Psion excels at. In pen mode the OmniGo feels very like the Newton but the OmniGo also enables click and drag of

items such as the Graffiti dialogue box. One thing is certain. The screen

is too small and looks strange fitted into the OmniGo's rectangular form. You do find yourself peering into it more closely than you would like. The display has some nice touches however. You can rotate it if you prefer to use the OmniGo in vertical hold and the eraser feature is particularly satisfying. The screen is highly

sensitive and responsive to even the lightest of pen taps — something the earliest Newtons were not very good at. Whatever its pretensions, this is basically an organiser and HP has packed it with everything that you would expect: diary, address and phone number databases, to-do listing, spreadsheet and calculator. And all the features can be edited using the pen or the keyboard. There is also a useful Financial Tools package which includes HP-12 calculator emulation and, unusually in a PDA, a stopwatch.

On the hardware side, 1Mb of RAM comes as standard along with a single PCMCIA slot and a serial port to talk to your printer or fax modem. HP will also shortly announce an add-on connectivity pack to link files between the OmniGo and your desktop PC.

OmniGo accepts the limitations of Graffiti (slow, unintuitive) but it remains the most robust form of a still developing technology. Until it is perfected I will continue to trust input from a palmtop keyboard. Of course you don't have to take notes on a palmtop and the OmniGo's pen works just fine as a pointing device in all its applications, so in effect you get the best (or worst!) of both worlds.

Using this pre-production unit for such a short time does not represent a full test. Longer acquaintance would determine its suitability as a permanent digital companion. Despite its clever integration, however, my gut feeling is that the OmniGo 100 has nothing about it to really best the Psion 3a.

PCWDetails

Price £290 (plus VAT)
Contact Hewlett-Packard Customer Information Centre 01344 369222

Good Points Compact in size, responsive pen. Clever hybrid design gives choice of pen or keyboard input.

Bad Points But both have their limitations. Small display.

Conclusion Built-in Graffiti software is accurately robust but typing on a Psion is still faster and sweeter.

SOFTWARE

PageMaker 6.0

PhotoShop plug-ins get the thumbs-up but Pagemaker 6.0 is no radical overhaul. The real conundrum remains unsolved, observes PJ Fisher.

PageMaker still has a lot of fans in the PC world, unlike the Mac arena where it has all but lost the professional publishing market to Quark XPress. It is perhaps a little odd then that the PC version of 6.0 should arrive two months after its Mac cousin but I guess Adobe has a different set of priorities — it wants to re-establish PageMaker as a serious publishing tool and refuses to admit defeat. Hence this roll-out.

But, as they say, therein lies the rub. In the PC world the entry-level market for DTP is alive and well and PageMaker is seen as a rival to low-end packages such as Microsoft Publisher, Serif Page Plus and GST Pressworks. All sell for considerably less than PageMaker; under £100.

We looked at a late beta build of PageMaker 6.0 running on Windows 95. It was mostly robust but was prone to a few jitters when implementing key components such as the HTML tools, PhotoShop plug-ins and creating Acrobat PDF files. However, it could all be made to work with perseverance and will undoubtedly be smooth as butter in the final release.

So what do you see when you launch PageMaker 6.0? Well you see PageMaker basically. There is no radical new look to play with, which will appeal to traditionalists but might disappoint those expecting something revolutionary. All the familiar tools, menus and text-handling procedures are unchanged.

But Adobe has been at work. What used to be called Aldus Additions are now called Plug-Ins, bringing PageMaker into line with Adobe's standard nomenclature. What a shame then that the plug-ins are not quite those you have come to expect, in PhotoShop for example. The name may have changed but the plug-ins are pretty much the same collection of Aldus scripts. However, there are two honourable exceptions.

Photoshop Effects really does bring the power of Photoshop directly into PageMaker's interface, so you can apply filters directly on the page. As standard

you receive a number of Gallery Effects and the package should support after-market plug-ins, although I guess many PageMaker users will be happy with the standard kit.

The other excellent new plug-in is the Guide Manager. This is an excellent tool that gives you literally hundreds of options for setting guides on the page. It is easily the best implementation of guides on any DTP package.

On the whole most of the plug-ins are the same Additions that featured in previous versions of PM. For example Balance Columns has never worked properly, and Expert Kerning just scripts a process far better done from the Control Palette. Incidentally, this is a far more powerful facility than generally realised and gives fine control over kerning, tracking and font specs. Typographic controls are as good as any.

Elsewhere you'll notice a new Polygon tool in the toolbox. Again, this is hardly a power-level tool but it provides a simple method of creating polygons. These can be turned into multi-pointed star shapes but nothing more irregular than that. But it's neat and simple to use.

Text wrapping has not been improved and remains weaker than XPress, but is good enough for the sort of less-than-ambitious design work that most PageMaker users will do.

Magnification has also been improved with the introduction of a drag/zoom facility that has been sorely lacking until now.

Users at all levels will be delighted to see multiple master pages — up to 256 in a single document. This is very useful if your publications have several different page master designs.

Other useful new features include the extended grouping and hiding tools. You can, for example, now send objects within layers rather than simply to the back or front. Objects can also be grouped and treated as single units and lined up to a grid with ease. All these are



PageMaker 6.0 displays its new colours

major plus points. Another nice touch is the right click which zooms into a spot and then out again.

The really advanced stuff that Adobe has built-in refers to colour-management systems and colour trapping and masking. This is all very well, but I wonder how many of PageMaker's PC fans really need or understand such high-end repro tools.

Power users or not, PageMaker still needs a complete interface overhaul. Successive upgrades have left it with a mix of duplicated functionality, with too many controls scattered in far-flung dialogue boxes involving several mouse clicks to achieve results.

Overall PageMaker finds itself in an odd position. It is far superior to other PC-only DTP packages but is still outshone by XPress in the pro market. Unless the publishing and design industries decide to shift en masse to Windows high-end development on PageMaker for Windows seems a waste of effort.

The conundrum for Adobe is that PC users love PageMaker, but they are not pro users and don't want power repro features. On the other hand Mac PageMaker users are ALL power users but they all use XPress. Cute problem.

PCWDetails

Price £515, upgrade from £100 (from any version)
Contact Adobe UK 0131 453 2211

Good Points Ease of use, Photoshop plug-ins, smooth grouping and hiding tools.

Bad Points No real fresh face, interface is becoming messy. Plug-Ins need to be developed.

Conclusion Still a fine DTP package but a lot of power in this release will go to waste.

HARDWARE

Two budget CD writers

Gordon Laing reviews two new packages, from Hewlett-Packard and CD Revolution, that offer complete CD writing capability for under £1,000.



CD writing has always been considered expensive, and somewhat of a black art. Fortunately, both perceptions are a thing of the past with complete all-you-need bundles available at previously unheard-of prices. We've reviewed writers costing under £1,500 before, but here are two writers which come in complete bundles with SCSI card, software and blank media for under £1,000.

Both internal writers have not only the complete bundles in common, but additionally boast double-speed writing, and quad-speed reading capabilities. They are courtesy of newcomer to the field, Hewlett-Packard, and veteran distributor CD Revolution which, possibly inspired by HP, has created a retail bundle imaginatively named the CD Recording Kit. CD Revolution is OEMing a writer from a manufacturer it would prefer us not to name, but suffice it to say that this manufacturer is Japanese, has already made many CD writers and is big in motorbikes.

Ease of use is a crucial issue. Consequently both kits come complete with all you need to start writing CDs from scratch. HP offers the SureStore 4020i writer,



Advansys 5150 ISA SCSI-2 card, cable, two blanks and a variety of software, including a database package, photo CD viewer and suitable writing software. CD Revolution supplies the CDR-24 writer, Adaptec 1505 ISA SCSI card, cable, caddy, two blanks, and a choice of either Corel CD Creator or CeQuadrat WinOnCD ToGo.

Installation of both drives is a doddle. Set up the SCSI card, or connect to an existing one, reboot and install the writing software. Both packages require you to identify the writer and allow you to set up performance factors, the most important being writing speed. If your hard disk plods along, it's wise to write at single speed, or at least run the supplied speed checks, otherwise you could end up spoiling your blank disc. Both suppliers recommend a transfer rate from your hard drive of at least 800Kb/sec.

Spoiling blanks is infuriating, but not as big a deal as it used to be, with typical media prices of between £5 and £10 each — that's 650Mb formatted information, or over 70 minutes of CD digital audio — good value by anyone's books, and of course best of all, compatible with any existing CD-ROM drive or player.

CD-ROM is a write-once medium, so there's no going back once you've started the writing process. Fortunately it is possible to add data at a later date until you've filled the disc, but not over areas already written. Each recording is known as a session, and the capability to write or read these multiple sessions as multisession. Be aware, however, that each session has a lead-in and out track which occupies between 10 and 20Mb; effectively wasted space. Both these writers are multisession devices.

Write-once could be considered inconvenient since you can't re-record over already written-to areas, but for backup and archiving it is ideal. No-one can erase the data unless they physically damage the disc.

HP charges around £10 for its recom-

mended blanks which it claims have a 100-year life as opposed to the shorter span of normal blanks, but it's difficult to prove. It's worth remembering that CD-ROM discs are more fragile than normal pressed CDs and should be treated with care: keep them in their cases and out of sunlight when not in use.

Both writers successfully wrote at double-speed, although we did use a fast Adaptec 2940 PCI SCSI card and a quick Quantum hard drive. For no-worries writing at higher speeds, it really is beneficial to use a large SCSI drive connected to the same SCSI chain as the writer. This is one aspect where HP's supplied card falls down. Despite offering bus mastering, it does not have on-board bios and consequently will not support a booting SCSI drive. HP claims that having a card dedicated to the writer alone will ensure no interference, but in my opinion, CD Revolution bundles a far more useful Adaptec card, although power users may find the ISA bus on both supplied cards a little limiting.

The quad-speed reading claims are true for data transfer, but don't expect too much from access times. You can use both writers as plain CD-ROM drives, but they're not particularly fast — much better to have a dedicated reader.

Both kits represent excellent value for money. If we had to choose one, CD Revolutions would probably have the edge thanks to a more useful SCSI card, Win95 ready software, and the fact that the writer manufacturer is not new to the game.

PCWDetails

Hewlett Packard SureStore 4020i

Price £829

Contact 01344 369222

CD Revolution CD Recording Kit

Price £749

Contact 01932 562000

Good points CD writing complete for less than £1,000.

Bad points They're not sub-£500 yet!

Conclusion Both kits superb value.

SOFTWARE

The National Lottery™

The Brookside Close lottery syndicate would have avoided a lot of grief by using the Multiple Board facility says Michael Hewitt.

There are several lottery programs available, but this is the first product to have been developed specifically for the UK market. The screen interface is based on our own National Lottery graphics, including the by now depressingly familiar crossed fingers. So what does it do for you that choosing the numbers with a pin or praying to St Jude wouldn't?

The program (3.5in disk and CD-ROM) installs in under a minute. This done, click on the Lottery icon and the graphic of a blank red playslip appears. Choose New, and you're prompted for your name and the playslip name. Enter anything you like here. Winning Ticket, for example. On the other hand, if it's a rollover week, you might choose Rollover. Next, using your mouse, fill in the playslip numbers, exactly as if you were choosing them with a ballpoint pen

in the newsagent. Or you can ask the program's inbuilt random number generator to choose them for you. It's all very easy.

The next step is down to you. Having made a note of your chosen numbers, you have to actually go out and enter them in a *real* playslip, pay for your ticket, and then wait for the balls to drop. As Anthea Turner reads them out, fire up the program again, go into the Results Screen, and key in the winning numbers. If you've got three or more, the software responds with progressively more enthusiastic (but not overly so) sound effects. It has to be said that its reaction to winning the jackpot — a muted round of applause — is decidedly blasé. The Hallelujah Chorus would have been better.

Other features include a statistical analysis of winning numbers from past



The National Lottery Program has been designed to look as much like Camelot's genuine article as possible

lottery draws for those dumb enough to believe the selection is anything other than random. There's also a Multiple Board screen for people involved in a lottery syndicate, keeping track of who's paid what. And, importantly, the software will prompt you to go out and buy a ticket.

PCWDetails

Price £12.99

Contact GSP Software 01480 496 666

Good points Easy to use, good graphics and excellent value for money

Bad points Decidedly tacky sound-effects.

Conclusion Good fun, at just £12.99.

HARDWARE

New Quad-speed CD-ROMs

Gordon Laing reviews two new quads with a different twist.

Panasonic has at last made its tray-loading ATAPI quad available in a retail pack named the QuadPro IDE, while Plextor's latest caddy-loading SCSI drive, 4PlexPlus, claims to be the world's fastest quad-speed.

Panasonic's is interesting because it's effectively the replacement for what is probably the world's most widespread CD-ROM drive, the double-speed CR-562/563, Panasonic's proprietary interface which was fitted as standard to many sound cards.

The QuadPro IDE is an enhanced IDE drive, indeed it's already fitted to many PCs off the assembly line, but is now available off the retail shelf. You can use your existing IDE interface or the one supplied.

Plextor's 4Plex Plus is interesting on several counts: the company believes the quality market is SCSI and sticks to the traditionally higher-end interface, while the claim to be the "world's fastest" is due

to the fact that it's a 4.5 speed drive.

We've seen loads of quads, and several 4.4 speeds, but I suppose Plextor has just squeezed into the lead with a 4.5 speed, effectively confirming the "fastest quad-speed" claim.

SCSI handles multi-tasking much better than enhanced IDE and also supports up to seven devices, both internal and external. This flexibility and high performance has seen it fitted to servers and high-end desktops, but don't let that put you off going for SCSI. You will need a SCSI card, and we recommend any from Adaptec.

The 4Plex-Plus is also



plug-and-play compatible with the new SCAM (SCSI Configured Auto-Magically) standard, allowing it and a SCAM compliant card to automatically select IDs to avoid conflicts.

Plextor additionally supplies a good set of drivers and utilities which, considering everything else, makes it an innovative high performance package, although not a cheap one.

PCWDetails

Panasonic QuadPro IDE

601 Kb/s

Price £139

Contact Panasonic Computer peripherals 01344 853913

Good points Cheap and capable quad.

Bad points Six speeds dropping in price.

Conclusion Good choice for the as yet unquadded.

Plextor 4Plex Plus

682 Kb/s

Price £279

Contact Tekdata 01782 577677

Good points Fast, good software, plug and play.

Bad points Double the price of your average quad IDE.

Conclusion Excellent quad, but close to six speed prices.

SOFTWARE

Microsoft Publisher 3.0

With online help and an excellent general manual, this version of Publisher is perfect for entry-level DTP, says Tim Nott.

To run this latest incarnation of Microsoft's entry-level DTP package, you'll need at least a 386DX running Windows 95 or NT Workstation 3.51, with 6Mb RAM for the former and 12Mb for the latter. Disk space required is 6-32Mb, depending on the options installed.

Publisher has always concentrated on ease of use, and this version is easier than ever. There are over 100 "PageWizards" to help you get started. Choose the Brochure PageWizard, for example, and you'll be prompted through successive screens for information such as the style, number of pages or company name you want. When the Wizard has finished setting up the document, it stays lurking in the background ready to offer "help as you go" — click on a dummy headline, for example, and a bubble will pop up explaining how to replace this with your own text.

The help doesn't stop there, as you can opt to have a help panel and/or index on-screen all the time, neatly slotted in beside the document you're working on. The contents change to reflect what you're doing, and they can be hidden away with a single click. In addition, "first time" help panels appear when you first do something (probably unwittingly), such as snap to a guide or place a "layered" object. Finally, you get regular prompting to save your work. More experienced users can, and will probably want to, turn these aids off.

The interface has been slightly tidied up since version 2. Publisher 3 is "Office Compatible", which means not only will menus, buttons and keystrokes be familiar to Word or Excel users, it will share resources such as a spellchecker. Publisher doesn't go all the way in Office compatibility — it won't use existing custom dictionaries and you can't add a Publisher document to an Office Binder, but there is a shortcut to edit a Publisher story in Word.



Above Exciting effects in Publisher 3 — WordArt, borders, fancy first letters and rotating both text and graphics

Below Creating a newsletter — let the Wizard do the work

Previous versions introduced some very clever touches, such as automatic text wrap around shaped graphics — a task some PageMaker users still have to do by hand. Fancy First Letters was another elegant time-saver, which has now been enhanced to offer a choice from a gallery of ready-made or customised effects and the rather splendid Border Art, offers plain or fancy borders "by the yard", automatically resizing to fit the frame. As in version 2, you're not limited to office stationery sizes: Publisher will create documents up to twenty feet square.

A new rotation tool has appeared on the formatting ribbon. Previously, to set text at anything other than horizontal, you had to use the WordArt OLE applet. WordArt is still included, and all sorts of fancy warping and shadowing effects are possi-

ble, but it's now possible to rotate anything on the page — even a block of text — to any angle. Grouping objects together so they can be moved around the page as one is now much easier, as a frame appears around the selected objects with an attached button to group or ungroup.

The Design Assistants, as before, add more page Wizardry, creating things such as coupons, logos and calendars — the last with a choice of eleven languages. Down at the bottom of the tool palette is a large button for the new Design Gallery. This gives access to a whole library of predesigned features to which you can add. There are headlines, sidebars, pull quotes, clever page numbering effects and much more, all available in a variety of styles, from classic to modern with much in between.

Colour was always Publisher's weak point, and there has been some improvement here. You can now use one or two "spot" colours, and Publisher will separate the output, but there's no support for spot colour libraries such as Pantone. Facilities for sending output to a bureau are much improved, and with the help of the checklist Publisher provides, you should be able to discuss things such as halftones, process separations and trapping with your printer with some degree of confidence.

With the online help and Wizards, you may never need to open the 285-page book, the Publisher Companion. This would be a pity, as it is not so much a technical reference to Microsoft Publisher, as a guide to Desktop Publishing in general. It covers such topics as the principles of page design, choosing fonts for headings and body text, illustration and use of colour, choice of paper and printing. Included in the box is a catalogue of special papers and other hard-to-find stationery.

PCWDetails

Price Around £70

Contact Microsoft 01734 270000

Good points Easy to use entry-level DTP, with some ingenious effects.

Bad points Limited colour support.

Conclusion Will keep all but the highest power users satisfied.

HARDWARE

Orchid NuSound PNP

The first proper Windows 95 PNP sound card offers high quality sound samples with good compatibility. But, says **Gordon Laing**, you may still have to get your hands dirty.

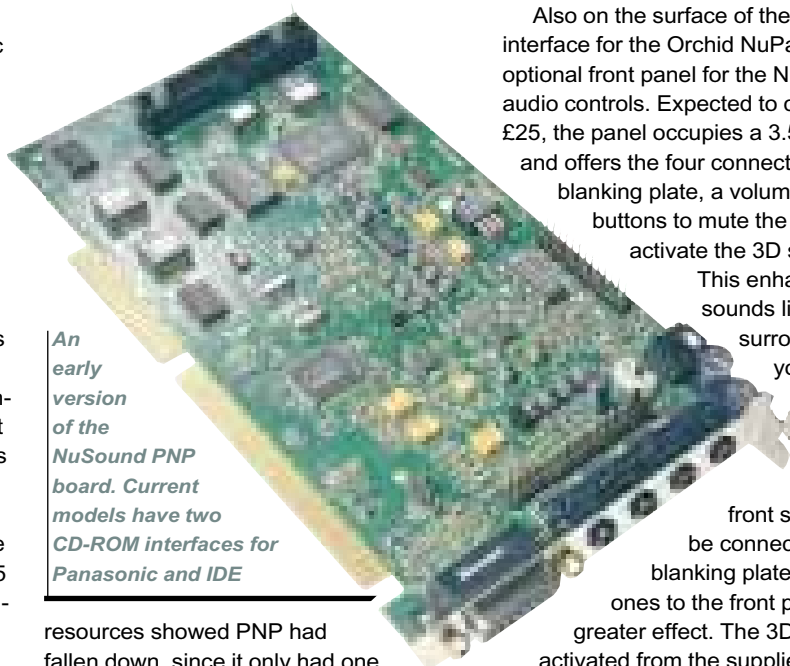
Once you've got past the enthusiastic singer on the cover of the box the first thing you notice are the words: Orchid NuSound, plug and play 3D Sound card with Wavetable synthesis.

This says it all really: Orchid's latest sound card is fully featured but not remarkable, in that it boasts 16-bit digital recording and playback, hardware wavetable synthesis and Panasonic and IDE/ATAPI CD-ROM drive interfaces. It's compatible with SoundBlaster (and Pro), AdLib, Windows Sound System and General MIDI. At £129 the price is alright, but again not outstanding with cheaper cards offering similar sound capabilities from the likes of Aztech. No, the special thing about the NuSound is that it claims to be the first plug and play (PNP) Windows 95 sound card; it's also compatible with Windows 3x. Sadly, the "easy, jumperless installation" wasn't quite that.

Plug and play does what it says. Just plug in your new piece of hardware and away you go. Fingers crossed, playing should be the only thing you worry about, with your computer doing all the technical legwork, solving hardware conflicts and automatically prompting for disks.

I eagerly slotted the NuSound into a spare 16-bit slot in my PC. As soon as Windows had started, the PNP experience began with "New hardware detected". The Orchid manual stated Windows 95 would spot and ask to install drivers for Windows Sound System, MPU-401 and GamePort Joystick, and that you should specify to read from the disk supplied by the manufacturer.

What actually happened was a detection of a CS-4232 chip (Orchid's chosen CODEC, compression decompression chip), which triggered off a compulsory search of the Windows 95 CD for a suitable driver. After this, I could install the previously mentioned familiar sound drivers as instructed. I called Orchid who explained that this was supposed to happen, but they neglected to mention this unexpected step in the otherwise detailed manual. One restart later and almost all was well. In the System control panel, one of the sound drivers was not working due to a hardware conflict. Checking the



An early version of the NuSound PNP board. Current models have two CD-ROM interfaces for Panasonic and IDE

resources showed PNP had fallen down, since it only had one of four IRQ interrupts to choose from and all were taken. These IRQs were occupied by old-fashioned non-PNP devices which wouldn't budge until I physically rearranged some jumpers.

The NuSound was much happier having found a spare location, but my troubles were still not over. The digital audio driver had PNP'd itself to IRQ 11, which was fine under Windows, but most DOS games only support a limited number of SoundBlaster IRQ options. Doom 2 only offers 2, 5, or 7, so before I could hear the plasma crackling, I had to manually change the digital audio IRQ to 5.

After this, everything worked perfectly. Doom and Descent played excellent General MIDI music, accompanied by SoundBlaster sound effects. Under Windows, WAV files played and recorded, 16-bit audio was clean, particularly at the maximum sampling rate of 48KHz. Orchid has software for DOS and Windows 3.1/95.

The wavetable section offers up to 32 simultaneous voices, including 190 instrument sounds and 46 special effects compressed onto a 1Mb ROM. The NuSound board has a port for a WaveBooster/WaveBlaster daughterboard card to upgrade the wavetable section: Orchid offers two (reviewed in this issue).

Four 3.5mm sockets accompany the

joystick/MIDI port on the blanking plate, offering stereo line input, output, amplified speaker output and mono microphone input. On the card itself are two internal CD audio connections for the SoundBlaster and MPC-2 standards; a cable is supplied with a microphone.

Also on the surface of the card is an interface for the Orchid NuPanel, and optional front panel for the NuSound audio controls. Expected to cost around £25, the panel occupies a 3.5in drive bay and offers the four connections of the blanking plate, a volume dial, and buttons to mute the sound and activate the 3D spatialiser.

This enhances stereo sounds like artificial surround sound. If you have the NuPanel and spatialiser activated, front speakers can be connected to the blanking plate and rear ones to the front panel for greater effect. The 3D option is activated from the supplied DOS and Windows software utilities, which include MIDI configuration, audio recording and playback, and an enhanced CD player.

Overall, the NuSound is a good sound card, offering all the compatibility you'd want and high quality General MIDI samples, considering all the sounds are compressed into a 1Mb ROM. The NuPanel is a nice touch which could prevent you scrabbling behind your PC all the time to find the right plugs. The plug and play aspect works well so long as you understand what it's capable of doing, considering other potentially stubborn non-PNP devices. PNP is definitely the future, but during this transitional period you'll have to occasionally give it a helping hand. You'll also be paying a slight premium for PNP, so if it's not important to you, look elsewhere and save some money.

PCWDetails

Price £129

Contact Orchid Europe 01256 479898

Good points PNP, good compatibility, front panel option.

Bad points PNP may need manual configuration.

Conclusion Slight premium for PNP, but good overall card.

QuarterDeck WebServer

A DIY webserver sounds too good to be true. Impressive, says PJ Fisher, but don't expect it to be as easy as ABC.

“Who says you have to be a programmer to set up shop on the internet?” asks the blurb on QuarterDeck’s Web-Server package. The answer: probably a lot of programmers.

But setting up your PC as a Web server using this package is relatively easy, and the opportunity to do so cheaply will appeal to small businesses and individuals keen to get onto the world wide web.

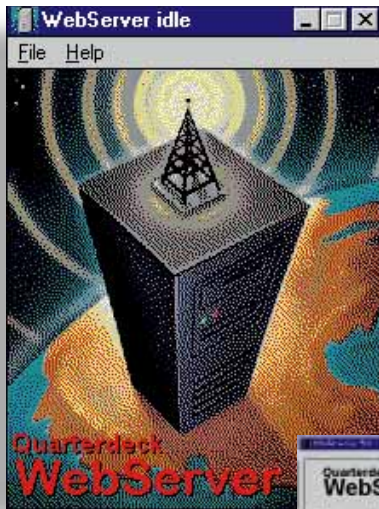
There's just two disks to install (about 2Mb hard disk space is required), and this version is Windows 95 friendly.

You also get 90 days free support and QuarterDeck have its own web site (www.qdeck.com) and BBS help systems as back up.

When installing WebServer you will be asked whether you want to install LAN Workplace. This is important as it contains the network support programs that WebServer needs to run — and it should run with the majority of network stacks. If unsure, consult your network manager. If you are worried about security, a log file records every hit to your site and who makes them. If you wish to remain absolutely secure, it may be worth installing WebServer on a standalone machine, but of course that would mean that no-one on the LAN would be able to access the web pages. Further to this, you can use restrict users with passwords and to users with certain IP addresses only.

When it comes to setting up, the manual is not a great comfort. Much better is the online Help system, but of course you can only get that after you have installed. The manual seems to be written back to front, with Chapter 2 serving as an introduction to web servers in general, while there are two different installation descriptions, one in Chapter 1 and another in the second chapter.

Fortunately, it is possible to ignore the manual, whack in the floppies and follow the on-screen installation requests. This can get tricky and you will need some



Left Once installed, WebServer keeps you informed of activity

Below *It's simple to change configuration*

TCP/IP
networking
knowledge.

For example, you need to know the IP address of your machine, its domain name and the subnet

mask. That's a second 4 byte value which specifies which bytes of the IP address are to be used as a network ID and which are host (your machine) ID values. Confused? you will be. On to your network manager again.

Meanwhile, the installation runs through all this and prompts you to fill in the correct details. Even if you are not sure what all these settings mean, you can get away with simply filling in the correct details in the right places.

WebServer hides a lot of the file placement in Windows 95 and configures them to work together. All relevant HTML and image files are placed into a folder called htdocs inside an Httpd folder on the hard drive. It is best to do this default install and this way you are unlikely to have problems and continue to use these folders when you create your own HTML files.

After install, restart and you will see the WebServer application sitting in the Start menu. Launch this along with your



favourite Web browser. To test WebServer type in a URL of `http://your-machine/` and the installed default home page should appear along with its images and hyperlinks. It worked first time across the LAN too and was immediately accessible on the internet. Leaving WebServer on your desktop enables you to see when someone is accessing the site.

Obviously you won't want to keep the QuarterDeck default home page for very long but don't trash it just yet. To start building your own home page you will need some knowledge of HTML and a decent web editor that will save to the .htm format. When you design a new home page it **MUST** be named INDEX.HTM so WebBrowser can find it and send it out to the client browser whether on the LAN or further out on the net. This is the default file a browser will display when the browser makes a request for <http://yourhost/>. I set

WebServer up on a bog standard Dell P60 with 16Mb of memory and a 540MB Hard drive and the whole set up took less than an hour.

There is a section in the manual about using CGI (Common Gateway Interface) scripts to create clickable image maps and a simple CGI example is installed for you to explore. This is

worth keeping if you have ambitions to set up image maps on your own home page. And believe me, you will., CGI or not, once set up WebServer runs unobtrusively in the background and all you need worry about is keeping your pages up to date. You don't need a degree in computer science to set up WebServer, but you will need a basic knowledge of TCP/IP and other networking protocols. You may not have to be a programmer, but beginners may as well forget it.

PCWDetails

Price £130 + VAT

Contact QuarterDeck 01245 496699; fax 01245 491480; info@qdeck.co.uk

Good Points Online help, once set up will run without problem.

Bad Points The confusing manual can make set-up problematic.

Conclusion An elegant piece of software to make your presence felt on the web, but it's not for beginners.

HARDWARE

Adaptec AIRport 2000

The idea behind the Adaptec AIRport 2000 must be the way forward. But not yet, says Simon Rockman.

What lies behind infra-red data is the ability to link computers. The Infrared Data Association (IRDA) standard consists of a serial link. Based on the earlier 9600bps serial infra-red standard (SIR) the IRDA committee has produced a standard for faster serial communications. This takes the line speed up to 115,200bps with a later specification, IRDA 2, allowing for 1.5mbps. An increasing number of new devices, Hewlett-Packard printers, most note books and even a Nokia mobile phone, have IRDA options.

So what if you have an existing machine and want to communicate using Irda? Well you could buy the Adaptec AIRport 2000, an Irda adaptor which plugs into a serial port and allows you to communicate with other Irda devices. You could, but it would be a very, very, daft thing to do, because the AIRport 2000 doesn't work very well.

In an ideal world you could wander

into the office with your notebook and exchange files between your desktop and your portable computers as easily as if you had connected a serial cable. But it proved easier to find a lap-link cable than to get the AIRport to work.

The theory is great: there are two flavours of AIRport, the 1000 and the 2000. The 1000 looks like a 9-pin to 25-pin serial adaptor except instead of the 25-pins there is a shiny plastic lens with an indent. The 2000 has the same lens, but is housed in a free-standing device which takes four AA batteries. Three quids' worth of Duracells mean that the range is extended from one metre to two. There is an option to take a 6v power supply but that rather detracts from the portability of the whole thing.

To get the devices to work (in the broadest possible sense) they have to be around one metre apart. There is a cone of infra-red 30 degrees wide and each device has to fall inside the cone. If the



two devices are too close together they will not work and since getting the two ends to see one another is hard enough in the first place you don't really want to upset anything.

The AIRport 2000 is supplied with the Transit software. The idea is that this sees the remote devices as another drive from which you can drag and drop files. When an infra-red connection is made, a new window lights up. In practice this doesn't happen unless you coax the system into life. We failed to get the Adaptec system to work with a Hewlett-Packard Omnibook, although this should have worked. There is a good future for Irda but at £100, the AIRport is not a device which is likely to take off.

PCWDetails

Price £100

Contact Adaptec on 01252 811200

Good Points An honourable attempt at an IRDA adaptor.

Bad Points Falls short with several existing IRDA devices.

Conclusion Not likely to take off.

SOFTWARE

Avery Label Pro for Windows

Let your labels stand out from the crowd says Sharon McGuill.

Targeted primarily at the SoHo and small business markets, Avery Label Pro allows you to easily design your own specialised labels. Text can be typed in direct, or accessed from existing files and records.

There are two main features of Label Pro: Designer, which lets you add

designs to your labels from Label Pro's clip art or your custom graphics; and List Manager, which merges text and graphics from a list function in Label Pro itself or from already established databases.

With over 150 label templates on which you can create and save your designs, you can merge from dBASE, Paradox, Word and ASCII comma separated (CSV) files. The merging function allows you to select the files you wish to print but it is limited in a single search. Label Pro's list manager is capable of holding internal lists with up to 15 fields and is particularly useful for printing video, cassette, disk and file labels.

Label Pro has a few extra features that set it apart from label functions within databases. These include "shrink-to-fit", which ensures no text is run-off the page; "print first label at", useful for those half-used sheets; an effective "on-

screen preview"; and "Postnet", for USA addresses.

LabelPro needs at least a 386 with 2Mb of RAM, 4Mb of disk space and a VGA display, you must also be running at least Microsoft Windows 3.1. If using a database with more than 50 records, it's best to print your labels with your Windows Print Manager switched off. Label Pro will print on laser, inkjet or dot-matrix printers supported by Windows.

The first 200 readers to call the Avery Consumer centre mentioning this PCW review, will receive a free sample pack of labels. Try before you buy with the free demo on this and last month's PCW cover discs.

PCWDetails

Price From £29.95 + VAT (Viking)

Contact Avery Dennison Consumer Centre 0800 805020. Fax 01628 764040

Good points Very easy to use and results are effective.

Bad Points Merge-select is a little limiting.

Conclusion An easy way of producing professional labels.

Have professional-looking labels with Avery Label Pro



SOFTWARE

Scan-IT

The idea of document scanning and filing in one software sounds like a dream come true, but Adele Dyer reckons this application is much too cumbersome to warrant its price.

Document scanning and filing has become popular as the idea of the electronic office finally takes off. At the moment, the basic scanning and OCR technology is all there and it is now a matter of finding the right filing software to go with this.

In the past few months PCW has seen quite a few document scanners, such as the Visioneer Paperport and the Umax Page Scan Device – packed with their own scanning, OCR and document filing software. We were therefore a little surprised to see the Scan-IT arrive as a standalone product sans scanner. However, it is compatible with over 40 different scanners, so we reviewed the application using the TWAIN compliant Umax Page Scan Device. The package does not include TWAIN drivers.

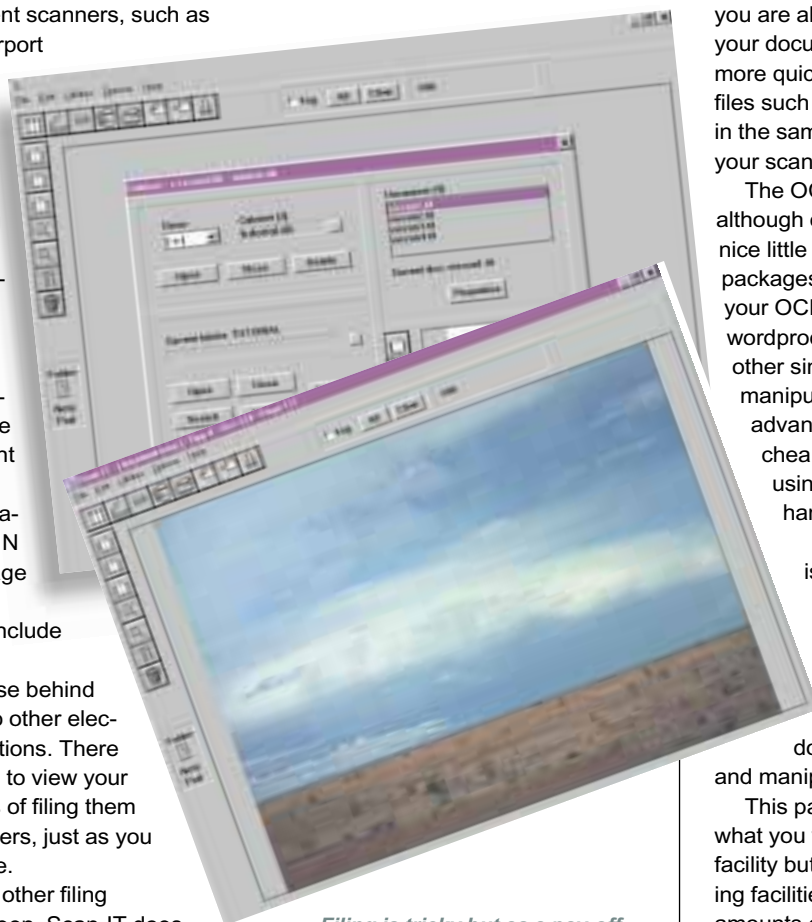
The basic premise behind Scan-IT is similar to other electronic office applications. There is a desktop for you to view your scans and a means of filing them in cabinets and folders, just as you would a paper office.

However, unlike other filing systems we have seen, Scan-IT does not give you as many pointers to where you are in the application and where your documents are. There is no bar to show what each of the icons means and the menus are skimpy, forcing you, horror of horrors, to go through the tutorial. Yet even after this, the lack of prompts leads to confusion and makes it, at least initially, quite hard to get to grips with — something of a surprise when all the other similar packages we have seen have been so easy.

You file your documents either in the notepad facility, that is straight onto the

desktop or in cabinets and folders. The notepad is simply like a physical desktop – somewhere to store your documents while you do some initial work on them and before you file them in a cabinet.

There are several problems with this. Firstly, it is not always easy to see exactly where you are. There is only a



Filing is tricky but as a pay-off, colour photo manipulation is available

small "switch" which lets you flick between the notepad and the cabinets, yet there is a marked difference in the way things appear on your desktop – or even if they appear there at all. Secondly, like most people's desks, if you put your work down on the notepad, forget it and go home it will disappear, especially as the package does not take abuse lightly and will crash if even slightly provoked.

Creating cabinets and folders again takes some getting used to. Not that the processes involved are complicated, simply there are a great number of steps involved in what should be a very simple operation, making it cumbersome and demanding to use. It will need some serious adaptation if it is to survive the onslaught of Windows 95. Why use a filing system which takes a dozen moves to create a folder, when it takes two clicks of the mouse to create the same effect using Windows 95 folders?

These are major problems which mar the product. It's not all bad, though. If you go through the process of filing properly, you are allowed to attach keywords to your documents to help you find them more quickly. You can also file foreign files such as sound, spreadsheets or text in the same cabinets as you are using for your scans.

The OCR engine is very good, although once again you do not get those nice little shortcuts as you do in other packages, such as a button which drops your OCR'd documents straight into the wordprocessor. One improvement on other similar packages is the ability to manipulate colour photographs – the advantage of not being tied to a cheap scanner, although of course using this facility depends on your hardware.

The main use for this package is primarily as a means of storing documents of various formats so that they can be easily viewed. Despite the handiness of this, the mechanics of the package does not make the file viewing and manipulation as easy as it could be.

This package is very overpriced if what you want is a document scanning facility but do not own a scanner. The filing facilities are suitable only for the vast amounts of documents generated by an office. Home or small office users are perhaps better off buying a bundled deal with scanner and software included.

PCWDetails

Price £170

Contact Grace Garret 0171 836 9486

Good Points Offers storage of multiple formats.

Bad Points Expensive and tricky to manipulate.

Conclusion SoHo users would be better off buying a bundled package.

SOFTWARE

Map 'n' Go

Take two route-planners into the motorhome? Dylan Armbrust just maps 'n' goes.

Have you ever thought about jumping on a Harley for that great USA road trip? Or maybe just take the family to the USfly the family over the Atlantic and pile in to a rented Ford Escort for two weeks. Either way, Map 'n' Go could be for you. Map 'n' Go bills itself as "The COMPLETE Travel Planner for North America" and I'd have to say that this isn't too bold a statement. It's a multimedia road atlas/route planner that can plan your travel route, highlight points of interest and give you detailed information on hotels, restaurants and campsites along the way. The package contains a CD-ROM, 128-page road atlas and an easy to read user's guide.

All you need is a 386 or higher, 4Mb RAM, CD-ROM drive and sound card (which isn't a requirement, but it is necessary to hear the audio presentations). I ran it on a P120 with quad-speed CD-ROM and 16Mb RAM. Installing Map 'n' Go took me no more than five minutes and it automatically detected whether or not I had a sound card and gave me the option of installing the drivers or bypassing sound altogether. I decided to try the tutorial first, and after a bit of engine revving and tyre screeching I was guided through the various features by a slightly twangy American female voice.

When you start the main program you are presented with a full map of the US, a floating toolbar and an overview map in the lower right of the screen. The toolbox contains most of the features needed to navigate Map 'n' Go. A large segmented compass allows you to move about freely over the surface of the map. There are two zoom control buttons that increase or decrease the magnification by factors of one and a quick zoom out button for getting an overall view. You can find any place by performing a Place name search. Or, if you want to discover where someone lives by their phone number or zip code, you can do that too, all at the touch of a button and a few keystrokes. I tried the Phone search to see how accurate it was, and it came up right every time. Same with the Zip code function.

Getting down to the nitty gritty of route planning was much easier than I

expected. Map 'n' Go gives you several methods of laying out your journey. You can point and click on map sites to add (or delete) way points. This is handy for map exploring to make up journeys along the way and see just how far you have to go. Or you can utilise the Manage Route box to enter your way points and destination if you already have a pre-planned journey. Regardless of what route planning method used, you simply select the type of route you want (Quickest, Preferred or Shortest), and ask it to calculate.

Quickest and Shortest are self-explanatory but the Preferred option checks settings you've previously entered regarding speed and what type of motorway you want to travel on (i.e. major highway or forest road). Once all is calculated, just select Along the Way and Map 'n' Go lists Points of Interest. From here you can select and play back your Points of Interest and attach them to your travel plan for when you print out.

I decided to put Map 'n' Go through its paces on some of my old territory to see just how well it holds up. I began with my family's old zippy USA shopping route starting in Toronto, Canada and finishing in Buffalo, New York. I added two way points along the route, one of them being Niagara Falls, just for the hell of it. I then asked it to calculate the shortest journey under the default settings and, presto, four seconds later it had the route selected. And whaddya know, it was right! It gave me a journey time of one hour and forty-one minutes with a distance of 101



The multimedia feature lets you be a tourist even before you arrive

miles. The only thing it didn't do was take into account the wait at customs. I then increased my speed settings to reflect the faster motorway speeds in Canada

and it managed to shave off eight minutes of travel time. Then I asked it to find me the shortest route and it managed to reduce the distance by four miles but increase the journey time by twenty-one minutes over the preferred route. Whoops! I knew there had to be a downside somewhere in here.

Once all is said and done I have to say that Map 'n' Go is a fairly sturdy program with enough depth to take you from the far reaches within the Arctic Circle to the sunnier climes of South America. The listing of hotels, restaurants and campsites appeared to be comprehensive enough, but is vulnerable to becoming out of date on prices. The only major drawback of Map 'n' Go that I found was the time it took to print out the selected route. Each page takes about ten minutes (depending on printer memory) to print out on a laser copier and this could mean waiting for a while if you have a lot of pages. In fairness, they do mention this in the guide and these waits are not uncommon for route-planning apps. So get your motor running, head out on the highway.

PCWDetails

Price £49

Contact Now Distribution 0181 288 3512

Good points Easy to use toolbox, lots of tourist info.

Bad points Lengthy print times.

Conclusion Good value for the information given and it was the only CD-ROM route planner for North America I could locate.

HARDWARE

Nikon Super CoolScan LS-1000

The Nikon Super CoolScan LS-1000 35mm film scanner does the job and does it good, says Gordon Laing. At nearly £1,800 though, it's strictly for the specialists.

Nikon's Super CoolScan LS-1000 is dedicated to scanning 35mm film and nothing else. While it will do positives and negatives, it will not take paper, card or larger format film. It does just one thing, and as you'd expect from such a reputable manufacturer, it does it rather well.

All scanners work on the same principal of reflection or transmission. The image is placed before the scanning head, consisting of a light source and sensor. The amount of light reflected by or transmitted through the image is picked up by the sensor, then converted to a voltage proportional to the light intensity — the brighter the part of the image, the more light is reflected or transmitted, resulting in a higher voltage. This voltage is finally converted by an analogue to digital converter into information the computer can work with.

The sensor on many scanners is a charge-coupled device, CCD. A CCD consists of many photo-sensitive elements, arranged in a grid in the case of a video or digital camera, or in a long, thin line in the case of desktop scanners; the more photo-sensitive elements per unit length, the higher its resolution.

Most A4 flatbed scanners boast true, optical resolutions of between 300 and 600dpi, and are capable of scanning an original image around eight inches wide. That's between 2400 and 4800 sensitive CCD elements along the width of the scanning head. The head of an A4 flatbed could squeeze its elements into a line four inches wide, but uses mirrors and lenses to capture the wider real area.

All A4 flatbeds scan paper-based originals by reflection, but by swapping the reflective light source with an alternative source from above, it's possible to sandwich and scan film by transmission. Such add-ons are called transparency adaptors and are available for most flatbeds, so why would you want a dedicated film scanner?

The point in real terms is that on an average flatbed you'll have between 300 and 600 dots per inch to play with, and that's absolutely fine for originals measur-

ing several inches on each side or larger. But what if your originals measure 36 by 24mm? Even a decent 600dpi scanner could only muster a maximum 24-bit file of 1.38Mb, which could only be reproduced in, say, this magazine at 72 x 48mm.

Not a particularly useful size, and that's the problem with 35mm originals: they're too small for normal scanners. Dedicated film scanners concentrate all their CCD elements onto a much smaller area, and in the case of the Nikon LS-1000, to a width of 24mm.

Nikon's LED scanning head will produce a maximum resolution of 2592 x 3888, resulting in a top resolution of 2700 dpi over the 35mm frame. It's a fast single pass device boasting 36-bit colour depth to adequately capture and resolve the subtle tonal differences found on film.

The unit itself is an unremarkable small box from the outside, measuring 151 x 268 x 63mm. It's a SCSI-2 device, connecting straight to a Macintosh, or requiring a SCSI card on a PC; we used a fast Adaptec 2940 PCI SCSI-2 card costing around £200, but slower ones are available for around a quarter of that price.

The front panel has a slot for the film. Mounted film can be inserted raw, or in strips of up to six frames once clamped into the supplied holder. When scanning, the Super CoolScan pulls the frame inside quickly for analysis, back out, then back in again more slowly for the final scan.

Even with six frames firmly clamped in the film holder, all can be accessed by sliding an inner sleeve in and out, or by turning the whole thing around. If you've got loads to do, an optional add-on automatically feeds mounted film.

The PC version comes with a TWAIN driver, while Macs use a traditional Photoshop plug-in; both have the usual scanner driver options, including one which reverses negative images into positive ones. Plug it in and install the driver —



An example 35mm scan from the Nikon Coolscan

that's all there is to set it up.

I scanned several images and was impressed, not only by the quality, but by the speed. Nikon's previous 35mm scanner, the CoolScan, was notoriously slow, often taking five or ten excruciating minutes per scan (it's still available for around £995). The Super CoolScan speeds through the process, delivering 10Mb files in around a minute; the maximum file size for a full 35mm frame at 2700 dpi is 28.8Mb.

So it's quick, and you can see the quality for yourself on the 6.5Mb scan printed here. It's expensive, but there's little to compare it to — that's the price you pay for dedication. If you want the flexibility of scanning variously-sized originals, both reflective or on film, buy a flatbed with a transparency adaptor. But if all you want is excellent 35mm film scans, look no further than the Nikon Super CoolScan LS-1000 — remember since it's SCSI, you can always connect a flatbed too.

PCWDetails

Price £1,795

Contact Direktek 0181 845 5969

Good points Quick, and high quality.

Bad points Only does 35mm.

Conclusion Perfect if you want pro 35mm scans.

SOFTWARE

Xcad 3.1

Looking for a reasonably priced 3-D design package with all the latest features? Xcad is putty in your hands, says Tim Nott.

Xcad is a 32-bit Windows Computer Aided Design package that runs under Windows 95, NT and, with the supplied 32-bit extensions, Windows 3.1. It's fully 3-D, but despite an impressive specification needs just 15Mb of disk space, 4Mb of RAM and a 386SX processor.

The interface is deceptively simple – below the menu bar is a ribbon of buttons for commands such as save, undo, grid snap toggles and line style/colour. A free-floating palette contains the drawing tools, two more floating boxes can be opened for co-ordinate input and object snaps, and a small "overview" window provides a quick way of zooming or panning a drawing. Although you can only have one drawing open at a time you can have up to eight different views.

Each button in the toolbox expands into a "fly-out" offering, for example, eight ways of drawing a circle – from centre-radius to tangent-tangent-radius. For accurate input you can "snap" points to a grid or to points on other objects – the end of a line or centre of a circle, for example. You can also define points by entering them in the co-ordinate box, specifying either co-ordinates absolute to the drawing sheet or relative to the last point.

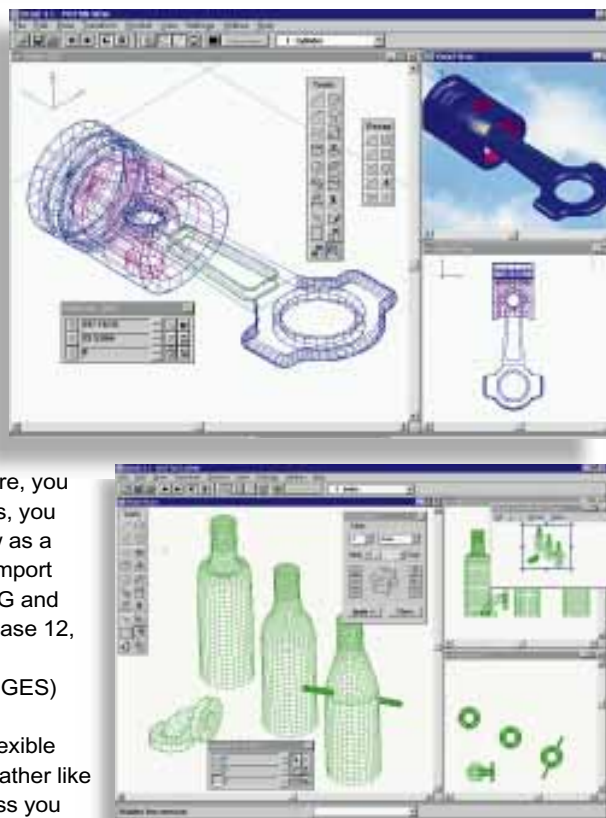
Non-uniform rational b-splines, or NURBS, are to CAD what Bézier curves are to illustration, but NURBS extend to three dimensions. There are ten ways you can draw a surface, ranging from plotting individual points (such as knots on a 3-D net), through rotating a shape around an axis or extruding it along a path, to creating a Coon's surface defined by four joined curves. Three-dimensional drawing is never easy, but Xcad succeeds in making it as painless as possible. A button on the co-ordinate box lets you switch between drawing in three planes, as on the surfaces of a cube, and if you want to work at an angle – say to draw on the side of a pyramid – you can set up multiple "User Co-ordinate Systems".

Having created 3-D surfaces, there are a number of ways they can interact – at the simplest level, you could use a

cylinder, say, to "drill through" other objects. More complex interaction includes blending – combining, say, two cylinders to form a bottle shape. 3-D surfaces appear as meshes, but to get a more realistic view you can remove lines that would be hidden in a solid object, or "render" the view to create solid, shaded surfaces with a variety of light sources. Though, as with other CAD software, you can't work in these modes, you can save a rendered view as a bitmap image. Xcad will import and export AutoCad .DWG and .DXF drawings, up to release 12, as well as Initial Graphics Exchange Specification (IGES) version 5.2.

There's a simple but flexible macro recorder which is rather like having an assistant to pass you the correct tools as you need them. If you draw two concentric circles, copy them in the Z-axis and create surfaces between them, you get a flange. Extrude the inner circle through a 90 degree arc, and you get a tube. Copy the flange to the other end of the tube and you get a pipe "elbow". Record all of this, and on playback, once you've drawn the circles, the relevant copy and surface commands will be activated in turn until the object is completed, but you'll be able to alter the size and position of the components as you go. More powerful automation comes via XDL – the Xcad development language, which can be used to create customised add-ons.

The version we reviewed was still in Beta, and showed a few anomalies. Not all the native Windows 95 features – such as the common File Open/Save dialogues – were implemented, though it did support long file names. We didn't have any documentation for XDL, and the supplied add-ins didn't appear to work. Stabil-



Top A 3D tutorial exercise

Above Examples of Xcad's NURB surfaces, with hidden lines removed

ity was also an issue: it managed to crash in a variety of ways, and once left Windows with a persistent "Out of memory" error that could only be cured by rebooting. If the release version cures these problems, then Xcad will be a remarkable product – I've seen nothing at a similar price coming anywhere near its 3-D capabilities.

PCWDetails

Price £495

Contact Digital Multimedia 0181 893 4000

Good points Fast, easy to use and offers astonishing 3-D features at the price.

Bad Points Beta version prone to crashes and didn't have full Windows 95 implementation.

Conclusion Unbeatable 3D capabilities at its low price.

HARDWARE

Canon SV-15A Multimedia speakers

One giant leap for Gordon Laing along the road to perfect multimedia.

Canon describes its new SV-15A's as "active multimedia speakers". Multimedia, in computer terms, means including sound capability, still and moving picture facilities and a CD-ROM drive in a hardware system.

For me, the word multimedia conjures up cheap and nasty upgrade kits, cobbled together with poor components in time to cash in on hype. But today's reality is fortunately much better with fast CD-ROM drives, excellent sound and video cards available cheaply and often supplied as standard on new systems.

The only piece of the multimedia jigsaw left with room for improvement is the means by which you hear the sound. Headphones aside, the obvious solution is a pair of speakers. Computer speakers should have magnetic shielding. Speaker drivers contain large magnets which can turn your monitor into a sixties-style psychedelic experience if placed too closely.

Magnetic shielding (if it works) blocks out the culprit fields, protecting your screen. Unfortunately many so-called multimedia speakers don't feature shielding, and were by no means hi-fi to start with.

Fortunately for Canon, it chose to break the typical rubbishy mould by making its SV-15A's shielded, sound good and even look good. The design is part of Canon's wide dispersion technology, giving a larger listening area than conventional speakers and eliminating the old stereo hot spot; it works too. Each speaker is 240mm high, has a base diameter of 162mm and weighs 1.75kg.

Out of the box, each speaker has conventional cable terminals for connection to a separate amplifier. There is also a mounting bracket for each, with wires on the inside for the speaker terminals, and tempting looking phono and power plugs on the outside.

Yes, plug these in and the SV-15A's



become active speakers, boasting an ample 40W total power; excellent for business presentations. Each bracket has two phono plugs, allowing internal mixing of two sound sources. Normally you'd just use one phono for each speaker. The supplied power supply connects to one speaker, and a second lead powers the second from the first. Overall these are excellent and capable speakers, ideal for raising the profile of the multimedia experience.

PCWDetails

Price £179

Contact Canon UK 0181 773 6000

Good points Look good, sound good.

Bad points Not to everyone's tastes.

Conclusion Superior multimedia speakers.

HARDWARE

Opti LCD monitor

With highly dubious claims to eco-friendliness, this monitor is a waste of money and desk space, says Simon Rockman.

We are all used to flat LCD panels. Notebooks use them, and over the years they've gone from being quite good to being exceptionally good. Notebook screens are being produced in vast quantities, so it is no surprise that they are

making a bid for the desktop. The new LCD monitor made for Opti by Compel – although like a lot of Opti products you'll see it wearing a number of different badges – is one of the first. The marketing departments will happily explain the advantages of flat screens: They are

ergonomic; they are good for the environment because they are low power; they look good and save space; and they are low radiation.

Unfortunately, most of this is claptrap. The Opti screen isn't ergonomic. It's small, but a 10.4-inch monitor is uncomfortable to look at (big is beautiful when it comes to screens), and the 640x480 resolution isn't the kind of thing you want to stare at all day.

The screen may not consume a lot of power but it uses a VESA slot (PCI also available) for its proprietary video card, which means using a desktop computer with a power supply which is about as green as Manchester United's first strip. LCD screens also take much more power to make and have a very high failure rate (often as many as nine faulty screens to make one good one). If throwing away a

lot of expensive duds to make components is green then I'm Napoleon.

Looking good is a matter of taste. If you want to reduce clutter it's good, but that is not the same thing as looking good. The Opti screen is hospital beige.

The radiation thing is a load of twaddle propounded by people who don't like working with computers and are egged on by quack doctors selling screen filters.

Within those limitations, the Opti does its job. It installs easily with Windows 3.1 drivers, is bright enough to use in a well-lit office and can be removed from its stand to be wall-mounted. The display is crisp and the viewing angle almost as good as a CRT. The video card will support a proper monitor at 1024 x 768. A passive version is also available: and is bigger, cheaper (£839) and higher resolution (800x600) but not as bright.

PCWDetails

Price £1,299

Contact Opti International 0181 507 1818

Good Points Your friends won't have one.

Bad Points Your friends won't want one.

Conclusion So why would you want one?

SOFTWARE

Logical Decisions for Windows 4.0

Logical Decisions for Windows takes the pain out of logical decision making, says Michael Eagleton.

The brain is very good at making decisions based on a few items, but for complexity and objectivity, decision support software is required. Computers cannot make decisions, but it's very nice when they remember everything you describe, involve you at every stage in the process, and churn all of your small choices into a grand decision. Logical Decisions helps you do just that.

Once installed, wandering into Logical Decisions for Windows seems like wandering into a dense jungle. The supporting literature and the menu options at first glance seem designed to get you entirely lost. But after the first few pages and jumps to mind-boggling chapters, you realise that this is no jungle at all. This is the Royal Botanical Gardens of decision making software and every tool is here, neatly tended and perfectly appointed.

Logical Decisions for Windows breaks the whole decision process down into manageable sections. It forces you through the structuring of a decision to allocate the Goals, Measures, Alternatives and Units. The Common Units and Weights of each Measure contribute to a Goal.

The first section is a neat way of graphically describing Goals and Measures. Measures are hung from Goals, building them into a decision hierarchy of limitless complexity, (the limit is available memory). In the background to this is the Measures Matrix, a data table of the relevant units for each Alternative.

The best feature of Logical Decisions for Windows is its ability to use textual definitions of Units, in addition to numerical values. These are ranked in order of priority, but the key is retaining the text connection to the world where the decision needs to be made, and maintaining your focus there. Putting a numeric value on the choice between "a Blue one" and "a Green one" takes your eye off the real world decision, and you begin to deal in depth with quasi-meaningful numbers. Text Descriptions are invaluable when the time comes to use the extensive graphics to describe your decision. For strictly numeric choices, it provides low

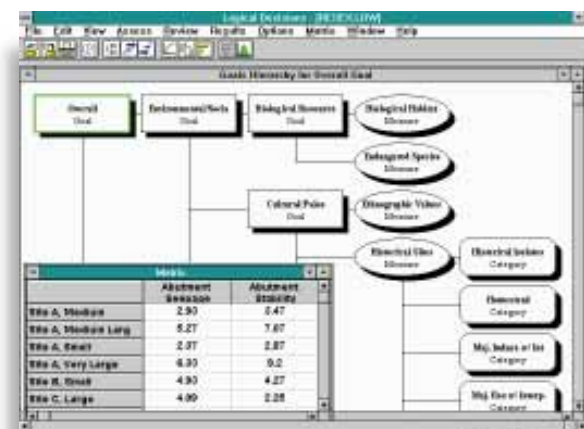
and high preference criteria and unacceptable cut-offs, or the possibility of statistical and probabilistic definitions.

Beyond the Units, and discreetly hidden in the background are the Utility components, or Common Units. This is where the power of preferences lies. Common Units are described on sliding scales (which is neat) or numerically, as "the usefulness of the unit for an alternative within a measure" (yes, these are the quasi-meaningful numbers). Logical Decisions for Windows uses these only to support the framework you have built so far, not as the key focus of it. This feature again keeps you focused on the real world options, while providing enough support for the computer to work in the currency it really understands. A very thorough approach.

After this, the Weighting of the contribution of each of the measures to the goal is identified. Very powerful tools for weighting include the "Gold Standard" of trade-offs between measures. The complexity or simplicity here, is of personal preference, each is handled superbly.

At the end of the garden is a very pretty display. Every decision criteria or weighting can be viewed, tested for sensitivity, scatter plotted, bar-charted or tabulated. It's not often that, when coming into a mathematical process programme for functionality that you expect the view to be very good. I was pleasantly surprised. There is an elegance in a programme that does all of its work in a large Times Roman. It looks good, it prints good, and it feels just a bit Bohemian.

Logical Decisions for Windows displays are used to provide insight into the defining aspects of why one solution is better than another, or to present them from different viewpoints, invaluable when reasoning to agree consensus. The results display is not just a series of lookups, each is a window that can be saved as a Windows Meta-File (.WMF).



Structuring decisions with Logical Decisions for Windows, is easy

The result displays begin the process of re-assessing your beliefs (or fiddling the weightings), refining what you feel the measures, weights and base values to be.

Two examples of where the software has been used are politics (where explanatory rationale for decisions is badly needed), and selecting the site of a military base. It excels at large problems and you grow to appreciate it as a power tool in the complex decision journey. You won't make use of it in an hour or be able to use it fully in a day, this is a tool for the detail researched, structured decision, and its mathematical integrity, complexity and solidness is impressive. It runs on a 386 or better, with 4Mb of RAM, needing about 5Mb of disk space. It recommends a 486 with 8Mb and a maths co-processor.

Logical Decisions for Windows comes as version 4.0 and shows the pedigree of coming through those 4 revisions. It is for everyone who has to arrive at, and explain, complex important decisions, and to enjoy doing so.

PCWDetails

Price £399.00 (+ VAT plus P&P)

Contact POW! Distribution 01202 716726

Good Points Its ability to use textual definitions of Units, in addition to numerical values. Impressive mathematical integrity, complexity and solidity.

Bad Points Not very quick when used on a 486DX 33 with 8Mb.

Conclusion A serious tool for big decisions.

SOFTWARE

LORIEN TextHELP! for Windows

Not just a proofreading tool but an invaluable aid to those with reading or other impairments, such as dyslexia, says Geoff Coggan.

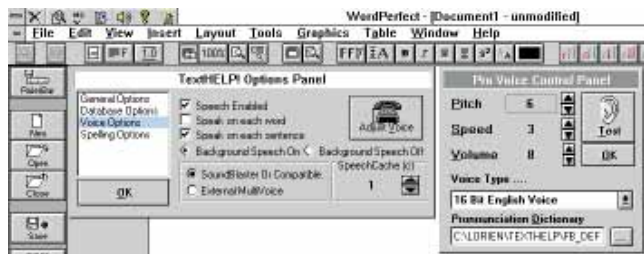
PC stalwarts may recall Monologue, a program which read back text using a speaker dongled into the parallel port, and which was especially helpful in proofing columns and rows of figures. It was distributed here by IanSyst, a company specialising particularly in voice programs including children's talking programs like the Dinosaur Discovery Kit.

IanSyst is now marketing Lorien TextHELP! for Windows, which is at one level a highly developed Monologue-style proofreader, but which also offers a great deal more — e.g. as an aid to computer users with reading or other impairments. Most of us using word processors have come to regard them as indispensable tools, forgetting that we used to manage perfectly well before the advent of computers. For most of us it is very much a self-created reliance — we can after all still write and communicate without them.

For some people, however, no such options are available and the computer has brought liberation. Lorien Systems (a software house based in Northern Ireland) has developed a range of applications to enable those with even severe physical impairments to not merely communicate but to use standard Windows software in doing so. The TextHELP! under review lies outside this highly specialised range and has mainstream functionality, not only in proofreading but in the help it offers dyslexia sufferers and those with reading, typing and spelling difficulties — all far more common problems than was once recognised.

The program installs with an uninstall icon to clear itself from disk, though I doubt if many trying it will want it off again. It takes up 8Mb of disk space and minimum specification is a 386DX running at 33Mhz, with 4Mb RAM. Its own RAM usage amounts to 1Mb so this is only really sufficient when using basic text editors. The requirements of full-blown Windows word processors like WordPerfect or Word make 8Mb a more realistic minimum.

Configurability is extensive, with the voice adjusting for speed, pitch and volume. Speech largely avoids the mechani-



With the aid of a sound card, text help can read text to you out loud

cal quality normally encountered. A question mark at the end of a sentence gives the voice a rising inflexion, and commas and brackets seem to be recognised in the flow of a sentence. As a rather unfair test I got it to read back Shakespeare sonnets from a CD. It made a great stab at this and did so in a voice like a cross between Donald Sinden and Douglas Hurd, which some may see as a step-up from that of a dalek. With mispronounced words, usually exotic forenames or technical jargon, it is a simple matter of teaching the program via its dictionary (or, rather, dictionaries, as many can be saved for different users or uses).

Voice options include reading back as you type, word-by-word or sentence-by-sentence; or reading sections of selected text (up to 66,000 characters). The former options are intended for dyslexic users (as is word-by-word spell-checking). TextHELP! can assist those with learning difficulties by suggesting word endings after the beginning of a word has been typed. Any suggested word can then be spoken. The spell-checker can be set to strict, normal or custom when suggesting alternatives, with a further phonetic button which can find even more words.

Getting users with slight to moderate degrees of dyslexia to test the program has confirmed its usefulness to them, though only professionals in the field of language disabilities could evaluate the help it offers those with more severe impairments. Clearly, used at extreme levels of disability the task of getting words onto paper is slow, but it may be near-impossible by other means.

The screen grab shows dialogue boxes that would never appear simultaneously in actual use. At top left, above the WordPerfect menu bar, is the small TextHELP! button bar which is all that normally displays. Top mid-screen is the Options panel, displayed on Voice Options. Right of this is the Adjust Voice

button which brings up the Voice Control panel where speed, pitch, etc can be tested and set. The Speller Box on the left pops up as needed. For example, on a word-by-word spell-check it will display

whenever an error is encountered, simultaneously beeping or saying that there is a possible error. To help a dyslexic typist correctly choose the word he/she wants from the list of suggested replacements a button on the Speller Box will speak any or all of the words listed.

Finding fault with the program is difficult as it does all it sets out to do. One criticism concerns its manual. Seeing that one role for the program is to help dyslexic users the manual should be a model of clarity. It isn't, though this shortcoming, which it shares with far too much software, is largely overcome by the excellent online Help. Even where this duplicates the manual text, there is something more logical about the way it is set out and compartmentalised, that makes it far easier to use.

Version 1.3 was introduced during the course of this review and appears to have got on top of the many variables which modern high-powered machines present to software developers. It has been tested on a Pentium with Sound-FX soundcard, PCI and ATI 64-bit video accelerator, and on two 486s with Soundblaster 2 and Cirrus Logic or Western Digital local bus video, working in exemplary fashion on them all.

PCWDetails

Price £75 for single user, special rates for schools and universities

Contact IanSyst 0500 141515; fax 01223 426644

Good points Fun to use and very useful.

Bad points Slightly pricey for the casual user.

Conclusion Invaluable for those who want to vocalise text.

SOFTWARE

MINITAB 10 Xtra for Apple and Windows

With a new graphic user interface and a host of new features, Minitab is still set to be the world's favourite statistical software, says Eric Adler.

Minitab is probably the world's most widely used statistical software. More students are introduced to the basic concepts of statistical analysis through Minitab than any other statistical package.

Having been supplying statistical software for over 20 years Minitab had let a certain degree of inertia set into their product development. However, with this long awaited 32-bit version Minitab have arrived at a cross-platform standard user interface which is now virtually identical in the MS Windows, Windows NT and Apple operating environments with the same handbooks and documentation for all versions.

This documentation is on a grand scale; the Minitab 10 Xtra "Quick Reference Card" runs to twenty eight pages, the User's Guide is now almost 300 pages and the main reference manual is over 1,200 pages while the online help files total almost 5mb and there are a further two hundred example files in addition to a 14 lesson on line tutorial.

Minitab 10 Xtra installs OK in Windows 95 but produced error messages and on just one occasion shut down suddenly with data loss. In Windows 3.11 Minitab 10 Extra runs under a custom Win32S installation included on two extra distribution disks and in this environment it proved to be stable. Minitab 10 Extra can now import files in Excel 5 and Lotus 123 format and permits data to be pasted to and from other spreadsheet based Windows programs.

Minitab also has DDE linkage with other Windows programs, and another major area of improvement, OLE2 linkage means that result screens and graphics can be pasted via the clipboard into MS Word and other word processors. 32-bit coding permits click-on graphics editing with dragging and dropping. Text and arrows can be inserted into graphics, but unfortunately in the Windows version this proved to be slightly difficult to implement with some elements refusing to respond to mouse clicks or to the "Bring to front/ send to back" command. Customised graphics layouts can be saved as templates in much the same

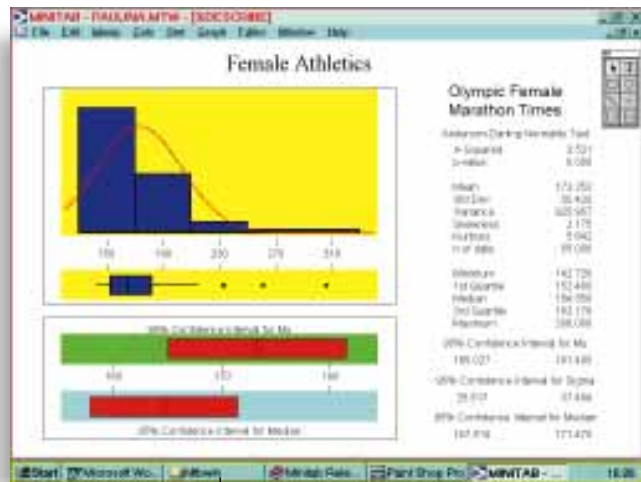
way that a series of commands can be saved as an executable macro, making this version of Minitab a smart package to work with.

From the point of view of data analysis as opposed to user interface, the most obvious improvement is the new combined data and graphics screens. This produces report-ready output with a single mouse click; formatted output ready to be copied directly into a word processing document. The descriptive statistics screen shows a well formatted histogram with superimposed normal curve alongside essential data analysis in a single unit.

The distribution curve over plot is limited to normal and I for one would like to see a choice of distribution function curves as is offered by Unistat and Statgraphics. However, having this simple one step analytical output routine is a great improvement, as is the residual plotting function which presents the four standard residual plots. Normal Plot, I chart, Histogram and Residuals v Fits are presented in a single editable graphic. This has the added advantage that the plots may be brushed (individual points identified by row number by being clicked on), although the rows identified cannot be marked; neither can the brushing results be saved from within the program.

Other major areas of development include enhanced routines for Quality Control, Process Capability and Character Control Charts. With the addition of a wide range of charts including Zone, Short Run and percentage XS Charts and XR Charts, Minitab now has one of the strongest applications available for this specialist area. Like all Minitab graphics, the charts can now be custom edited.

Minitab has long had a strong experimental design capability (DOE) featuring



Minitab 10 Xtra now offers combined data analysis and graphics output

functions for the identification of significant variables, Interaction Analysis, Screening Designs, Factorial Designs, Response Surface Designs and Contour Plots which now all come with new improved 32-bit graphics editing capabilities. These DOE features allow the greatest access and interpretations of the data, with the least trial and error. They also allow the user to determine the optimal settings with ease. Other major areas of innovation include Time Series Analysis with over 60 functions where time series graphics can be custom edited and brushed and Analysis of Variance with improved residual charts.

The problems which arose with Minitab 10 Xtra in Windows 95 were mostly teething troubles, often encountered in a late beta release. But when the bugs are fixed, Minitab 10 Extra will be a reliable stable product in the Minitab tradition.

PCWDetails

Price £695 (plus vat), Academic orders £395.

Contact Minitab 01203 695730. Fax: 01203 695731. Freephone 0500 586587

Good Points Promises to be a reliable, stable product once the bugs are ironed out.

Bad Points Some problems in Windows 95.

Conclusion A great improvement on earlier versions and will remain a strong contender amongst statistics software packages.

Fortes VFX1

Fortes VFX1 is THE gadget extraordinaire for those who can lay out the dosh. Run down the corridors of Doom or Rocket and blast your way in Descent. Either way, you're in the middle of it. The VFX1 has its own ISA card that links up with your graphics adaptor to give you one of the best virtual reality experiences around.

Contact **5DT (Europe)** on **0181 974 2044**.
RRP **£789.00 plus VAT**

**QuickCam**

It's more than just a sphere on a pyramid — the Connectix QuickCam allows you to capture greyscale movies or still images at a resolution of 230x240 pixels. You can use the pyramid as a stand, or remove the ball for a true mythological eye in your palm effect. At the time of writing, the QuickCam was a Macintosh only product, with a Windows version on the way. Macintosh version **£99.95**.

Contact **Computers Unlimited** on **0181 200 8282**

**NEC Silicon View**

Why bother with pesky moving parts which break down and eat up batteries when you can have a solid state portable video gadget? Because today, the several hundred megabytes required to store a movie on a credit card will cost you a fortune. In the meantime, dream of the future with this prototype from NEC, coming to a store near you in time for Christmas 1999. Hopefully it will be sold in more than just lurid pink.

NEC Europe on **0171 353 4383**

**HP OmniGo 100**

Want the power of an HP palmtop plus the convenience of handwriting recognition? Look no further than the smart new OmniGo 100. Its unique design turns an ordinary palmtop into a flat pen-driven device. The built-in Graffiti software means your scribbles are always recognised. Turn to First Impressions for more details.

Price **£290**. Contact **Hewlett-Packard** on **01344 369222**

**Trafficmate**

Tired of tailbacks and sucking fumes on the motorway? Now you can avoid these lovelies with Trafficmate. This handy dashboard mounted sensor can verbally tell you what motorway routes and junctions to avoid within a range of ten miles or two junctions for all motorways.

Trafficmate enquiries on **0800 707070**. Price **£49.99**

**Sony MD DATA Drive MDH-10**

Fully reviewed last month, the data version of Sony's MiniDisc system is a real darling. Not only can its magneto optical cartridges store 140 Mb, but it can also play back audio MiniDisc titles. With an optional PCMCIA interface, this is a truly all-in-one gadget for the worker on the move.

Sony Peripherals on **0181 860 0500**. It'll cost you **£499**



PCW How You Can Contribute To The Long Term Tests Section

We welcome contributions from readers for our Long Term Tests section. If you've been using a piece of hardware or software intensively for some time, just write a 450-word article (for hardware) or a 750-word piece with screenshot — GIF format — for software and send it on disk, in MS Word (Mac or PC) or ASCII format, to: The Editor, *Personal Computer World*, VNU House, 32-34 Broadwick Street, London W1A 2HG. Mark your envelope clearly "Long Term Tests". We'll pay for any contributions we use.

SOFTWARE**FirstClass**

Noel Chidwick hails this email/bulletin board system which opens up vast possibilities for distance learning and makes educational administration run smoothly.



Just over two years ago, I managed to persuade the powers that be in my college that we should take our first steps into the digital age. I was told to go ahead and investigate an email system for staff, particularly those with contacts in Europe, where we have many partners. We were not connected to the internet — the luxury of JANET being at the time the closed province of higher (as opposed to further) education, and the cost of connecting was prohibitive. I was also keen to investigate the possibility of operating online courses, where students study from home via computer and modem. It was essential that it should be easy to use.

I needed to look no further than FirstClass — an email and electronic bulletin board system. The user has a private mailbox and access to any number of private or public conferences. Uploading and downloading files is straightforward, and there is a chat facility, allowing folk to type to each other while online. It has an elegant graphical interface of folders and icons and is simple to use: most users are sending and opening mail within a few minutes of first connection. The interface is exactly the same whether you log on with a Windows or a Macintosh client (distributed free, incidentally) and an FC server can be accessed over a LAN, via a modem, and recently over TCP/IP — the internet.

The FirstClass server is neither RAM-greedy nor processor demanding.

I installed the software on a humble Macintosh IIvx with 8Mb of memory. I plugged a Hurdler serial port card into a Nubus slot; this accommodated our three modems with one socket in reserve. The IIvx was already linked to a small network of Macs via LocalTalk. Setting the whole thing up, from opening the boxes to first logon took a short afternoon (with a long coffee break for browsing the manual).

For a system administrator, FirstClass provides excellent control; it is possible to configure a FirstClass system differently for different groups of users. For example, on our system (called ETEL) I have set up a range of desktops for staff in the college; public users; and other groups who have used ETEL for their own needs. FirstClass can be configured so that conferences can be fully accessible, read only, or completely invisible. Both the local branches of the Labour and Conservative parties could have their own conference areas on one FirstClass system, and neither would know the other was there.

A further feature of FirstClass places it head and shoulders above anything else: gateways. It is a simple matter for the administrator to establish a gateway connection with any number of FirstClass boards. This has led to the growth of OneNet, a community of FirstClass boards across the world. It works like UseNet, in that conferences on a variety of subjects are "broadcast" over this network. A message sent to one conference

spreads to the other FirstClass boards on OneNet in hours. Other kinds of gateways are possible, and I set up an internet gateway as soon as funds allowed. This only permits email, but it does allow us to send and receive messages over the internet.

Administrators need to spend time planning the links between individual machines and conferences — that long coffee break with the manual is vital. But once the layout has been established, it is a matter of filling in forms on screen.

Complexity is well hidden behind a user-friendly interface and SoftArc has managed to pull off an amazing feat by combining power with ease of use. Praise is also due for the policy of issuing free upgrades to registered users.

The principal caveat is for the administrator, not the user. To maximise speed, SoftArc has written the software in such a way that thousands of files are created on the server. This makes backing up a tortuous process, which has to be performed while the system is offline. Having said that, not once in all this time has ETEL crashed — because of the FirstClass software — and it runs 24 hours a day.

The Open University has recently adopted FirstClass for delivery and support, which proves its value to those who work in education. It opens up huge possibilities — we will be able to offer courses to remote or housebound students that would never have been possible in the past.

2 YEAR
TEST

PCW Verdict

FirstClass is a mighty piece of software which makes mincemeat of Microsoft Mail, thumbs its nose at Lotus Notes — and is still as cuddly as a bunny rabbit.

Price 5 users: £330
10 users: £499
Telecom email: £299
Internet connection available

Contact Eurosource 0181 561 1993

HARDWARE

Escom 486DX40

A cheap, nicely bundled 486 that runs glitch-free for a year? Sounds too good to be true. Marc Hindley reckons Escom is here to stay.

1 YEAR
TEST

A year ago, I was looking for a new computer to replace my ageing 386. Price was important, but I also wanted a reliable dealer with a good name.

I had noticed Escom advertising quite regularly, but had not seen any reviews or heard of anyone using its machines. However, I had a feeling that it was going places. I travelled 245 miles to the Escom store in Aberdeen, and finally settled for a 486DX40 with 4Mb RAM, bundled with DOS 6.2, Windows for Workgroups 3.11 and Microsoft Works 3.0 for Windows, for an excellent price. I was intending to get a CD-ROM/CorelDraw bundle, but they had sold out. Another good omen, I thought.

Back home and out of the box, everything worked perfectly and first time. I had enormous trouble trying to connect a laser printer through the serial port, but that was my fault, rather than the computer's.

Only two complaints — and very minor ones at that — no DOS mouse driver was included and I was surprised to find some months later the Trident video drivers had not been installed, and I was running under a standard VGA driver. The disk was included (presuming it was the backup, I filed it) and an easy Windows installation made immediate improvements over the 640x480 setup I had been using, providing comprehensive power management facilities. So with a healthy 1Mb video card, my



screen now resolves at a comfortable 800 x 640 in high colour.

Expansion capabilities are adequate, with 32-bit and 16-bit slots vacant, one 3.5in and two 5.25in drive bays free on the front, and memory is expandable to 128Mb with 30-pin SIMMs. My model had no 72-pin SIMM slots, although I suspect that more recent ones do.

Operating systems and software bundles, though pre-installed, come with complete manuals and disk sets. No manual as such for the hardware, but wiring diagrams and instructions for setup and expansion are included.

It probably hasn't escaped anybody's notice that Escom have been in the news this year, first for their buyout of Rumbelows and then their unexpected takeover of Commodore. This was confirmation for me that I had made the right choice, and that the Escom name

From the moment it came out of the box one year ago, the Escom has worked perfectly

will become a recognised brand. A just reward for offering such value for money to a critical public.

After a year of near-daily use, I have had no problems whatsoever. When I'm ready for a replacement or an additional computer, an Escom will be high on my list.

PCW Verdict

Low-priced, reliable PCs with high spec and good bundles. Highly recommended.

Price £529 (DX/66 with 540Mb hard disk and 4Mb RAM)

Contact Escom 0990 555888

"You must be careful about giving any drink whatsoever to a bore. A lit-up bore is the worst in the world." — David Cecil

"If you drink enough wine, it doesn't matter how bad it is." — Anonymous



"I think a man ought to get drunk at least twice a year just on principle, so he won't let himself get snotty about it." — Raymond Chandler

TIPPLE TATTLE

What cocktail should you give your guests as an aperitif? What wine should you have with Christmas dinner? And what about all those party drinks and punches? Paul Begg weaves his way through the electronic booze guides.

PCW Wine, Beer and Grape Photography by David Whyte

If you are interested in wine, spirits, cocktails or beer, your computer can help you. There are software guides to wine, cheap and cheerful cocktail recipe databases, and a couple of must-have titles for the dedicated or novice homebrewer. You can also use your computer to access bulletin boards, online services like CIX and Compuserve, and the internet to exchange information and advice about your favourite drinks and places to drink. With Christmas rapidly approaching, we decided to investigate further.



ability to recognise the subtle differences between wines is an important part of the enjoyment. But the act of discerning the differences shouldn't be po-faced or snobbish. It should be fun. As Oz Clarke says on the Microsoft Wine Guide (see below): "I'll drink vintage champagne out of a tin mug if that's all there is... It may not be correct, but wine is supposed to be fun before it's correct."

Microsoft's Wine Guide

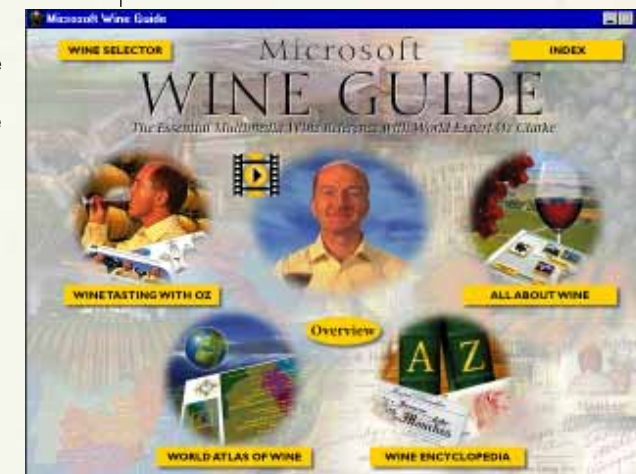
Oz Clarke, wine writer and one of the presenters of the BBC's The Food Programme, also presents Microsoft's Wine Guide and no matter how often you use this CD-ROM, his enthusiasm is always

Wine Guide's opening screen gives you several options to explore your tittle

Wine

The proliferation of books about wine and the wine courses in Sunday newspapers and on television shows how wine consumption and appreciation is growing in Britain. The trouble with books, though, is that it isn't always easy to find the information you need and the courses can be superficial. Which is where CD-ROM steps in. You can find the information you want at a key stroke and learn at your own pace. And even if you are perfectly aware of the difference between a Château Mouton-Rothschild '59 and a '64, there's still a lot you'll find useful on these discs.

The mystique that surrounds wine is due to its infinite variety. The taste can change according to the grape variety, the region where the grape is grown, or the amount of sunshine or rain in a particular year. The





infectious. The Wine Guide is the most comprehensive wine encyclopedia on CD-ROM. It covers everything from the grape on the vine to the taste of the wine itself. Everything you ever wanted to know is here — how to read a wine label, how to open a bottle, what sort of glass to use, how to judge the colour, bouquet and taste. A category called Wine Tasting covers every detail, from decanting, corks and corkscrews to how to spot a bad wine. There's also a video tasting tour in which Clarke explains what to look for, smell for and taste for in 18 wines, including champagne and port.

Perhaps the most used section will be All About Wine. Here information about the vineyard and the winery, classic grape varieties, reading a wine label and wine list is assisted by pictures, diagrams, video, and interactive charts. It is also the place where you can match the wine to your food. All you have to do is locate the food from the extensive lists provided and the Wine Guide produces a list of suitable wines. If you wish, you can narrow your search by specifying the country from which you want the wine to come.

In addition, there is an atlas of wine showing the 12 major wine-producing areas, plus 57 interactive maps and extensive information about geography and history, variety of grape grown and the way the country classifies the quality of its wine. Finally, an A-Z of wines

PCW Verdict

Microsoft's Wine Guide

This is an excellent introduction to wine, at a price not far off what you would pay for a good printed wine encyclopedia. In my opinion, it's also one of the best CD-ROMs you can buy.



“A good general rule is to state that the bouquet is better than the taste, and vice versa.” — Stephen Potter

includes almost 2,000 entries and a glossary of about 700 wine terms.

Wines of the World

This American CD is based on the 1992 book, *The Companion to Wine*, edited by Frank Prial with Rosemary George and Michael Edwards. It is not as comprehensive as Microsoft's Wine Guide, but the smashing photographs are a compensation.

You embark on your exploration of wine from a mood-setting main screen which has a photograph of wet, glistening grapes hanging from the vine and relaxing classical guitar music in the background. You can explore wines in four ways: via the Wine Browser or by looking at Wine Quality, Wine Appreciation or Wine Regions. With the exception of the Wine Browser, each section leads you to others.

Wine Quality gives you three choices: The Vineyard, The Grape, and Making Wine. Clicking on The Vineyard gives you a detailed text and 16 photographs of different types of soil, vineyards, grapes, care of the vines and so on. Clicking on The Grape gives you a description of the main grape varieties, each variety being illustrated. Making Wine is an illustrated step-by-step guide.

Wine Appreciation covers Wine and Food, Wine Colour, Wine Tasting, Serving and Storage, and Wine Labels. The information is provided as text, accompanied by lots of great

photographs. Unlike the Wine Guide, the program doesn't select an appropriate wine to go with the food you specify, but it provides plenty of good, solid information.

Wine Regions covers 18 regions (some are broadly defined, such as Far East, eastern

Just choose your food and let Wine Guide choose the appropriate wine



Top *Wines of the World: a smashing opening screen*
Above *Great photographs throughout and a straightforward text*

Europe, and so on), including some small wine producing countries such as Greece and the UK. Coverage is fairly comprehensive and includes a narrated “grower’s viewpoint”. For Greece, the grower is Mr Gervassiliou of the Domaine Carras and Gervassiliou Estate, who explains Greek grape varieties, growing conditions, wines, and future developments.

The Wine Browser allows you to search for wines — you just type in a grape variety such as Cabernet Sauvignon, select a producer, vintage, price, quality rating, and then Search. There's an excellent glossary of about 2,000 wine terms, too.

PCW Verdict

Wines of the World

While not as comprehensive as Microsoft's Wine Guide, the coverage of wine regions is more complete (the Wine Guide gives little more than nod in the direction of Greek Retsina, for instance) and the photographs are impressive.



The Interactive Wine Guide

It's not in the same league as the other two guides, but the Interactive Wine Guide costs a mere £14.95 (inclusive of VAT). For this, you get valuable wine tips from wine expert Robert

Mondavi and other noted connoisseurs, an A-Z guide of wine terms, an atlas of wine-producing regions and a descriptive guide to all manner of wines.

The disc is somewhat American in flavour, using the term "blush" for what we call "rosé" and giving emphasis to Californian wines. It is far from comprehensive and fails to explore the less common wine-growing regions. However, the wine novice will almost certainly find that it has all you need for finding a good wine to accompany Sunday lunch or to take to a dinner party.

You can investigate wines by their colour, find out about wine regions, or brush up on your wine terms. And there's a multimedia section that includes video and audio.

From the main screen, a mouse click on the appropriately coloured wine bottle takes you to an alphabetical list of wines. Each is accompanied by a broad description, some general information about temperature and ageing, the wine's characteristics (subtle, fresh, clean tasting, and so on) and the most appropriate

"Water taken in moderation cannot hurt anybody." — Mark Twain

foods to go with it. A mouse click on any green highlighted text produces a pop-up box containing a definition.

The tour of wine-growing countries — including Argentina, Australia, Chile, England, France, Germany, Hungary, Italy, New Zealand, Portugal, Spain, and the United States — is disappointing, consisting merely of a single screen of very broad general information. The dictionary of wine terms is more full-bodied: the definitions are short, but fine as a beginner's guide. Some are supported by narrative or video.

The multimedia section includes four videos and 17 audio extracts. All this information can be searched by word, but it isn't comprehensive. You can't type in "stew" for example, and get a list of every wine suitable to accompany a plate of that traditional winter warmer.

PCW Verdict

The Interactive Wine Guide

As a budget-priced beginner's introduction to wine, The Interactive Wine Guide has an acceptable nose, good colour and is satisfactory to the palate.



Wine Cellar

If you are a real wine aficionado then you must seriously consider this program. At first sight, it looks designed for anyone who has a wine cellar so big they can't remember where they left the claret. However, it has wider uses. First, you can keep a list of all the wine you buy, including where you bought it; you can make a note of

Curious wine fact

Sir Kenelm Digby holds the distinction of being the inventor of the sturdy modern wine bottle. He invented it in the 1630s — previously, wine bottles were very fragile and used mainly to take wine from the barrel to the table.

your impressions, as all the wine experts advise; and you can make notes of expert recommendations you come across and print out a list for your next visit to your local wine merchant. The disc also comes with details of 170 French wines.

PCW Verdict

Wine Cellar

For real aficionados rather than amateur wine-drinkers.



Booze Online

Both CIX and CompuServe have wine forums — try Wine on CIX and Bacchus on Compuserve — and there's enough going on the internet to keep even the most dedicated tippler happy.

Some sites to try are alt.food.wine, rec.food.drink, and rec.crafts.winemaking. The world wide web holds some promise too. Try <http://www.virtualvin.com>, a virtual vineyard devoted to wines from small US vineyards.

You can even order your wine via the web. Contact Sainsbury's Wine Direct on <http://www.j-sainsbury.co.uk>, make a choice from about forty wines on offer, order a case of what you fancy, and sit back to wait for it to be delivered to your home.

For beer on CIX try Beer, Booze, Drink, Drinkers, Food, Whiskey. On Compuserve look for the Beer forum. On the net, try alt.alcohol.

Hangover cures

"A good cure for a hangover is to drink black coffee the night before instead of the morning after." — Laurence J. Peter

That debilitating hangover is caused by the effects of ethyl alcohol in your bloodstream and the best way to beat the "morning after" misery is not to drink to excess the night before. Once the damage has been done, get some oxygen into your brain by deep breathing. Then dress comfortably, stagger downstairs and make yourself one of the following:

Fernet Branca

45ml (1.5 fl. oz) Fernet Branca (a thick black bitters with quinine)

45ml (1.5 fl. oz) Pernod mix in an old-fashioned glass with ice
Prairie Oyster
 Worcestershire sauce
 two drops of Tabasco
 yolk of a fresh egg
 salt and pepper to taste
 sprinkle the Worcestershire sauce in a champagne glass, drop in the Tabasco, add the unbeaten egg yolk and drink the whole lot straight down
 if this doesn't work, return to bed and don't expect sympathy from anyone — not even your dog.

"For a bad hangover, take the juice of two quarts of whiskey." — Eddie Condon

Cocktails

A cocktail is a drink consisting of two or more ingredients — usually a spirit, liquor and fruit juice — combined by shaking or stirring. The Martini is said to have been the first cocktail, but this is unproven. There are many stories as to how the cocktail got its name. The most recent I've come across is that a Frenchman in Betsy's Tavern near Yorktown during the American Revolution saw a row of bottles decorated with cocks' tails

"If you drink, don't drive. Don't even putt." — Dean Martin

and shouted "Vive le cocktail!" There are other explanations, but the origin of the word will probably remain lost in the mists of time forever.

Given that there are thousands of food recipe books on disk and CD-ROM, it's odd that the commercial software companies seem to have avoided cocktail recipes. This is especially odd when you consider that there are thousands of recipes, that the technical stuff (such as the correct glass and how the drinks should be mixed) is sometimes more complicated than with wine, and that there's loads of scope for audio, video and still photography. Nevertheless, cocktails are served by shareware. Glitz and glamour may be in short supply, but the content is solid. Each of the following programs are pretty much the same, the only significant difference being the way in which the information is presented.

Complete Bartender's Guide

The Complete Bartender's Guide is a basic DOS-based database of cocktails and mixed drinks. Be warned, though, some of the cocktail names are naughty to the point of being offensive — even to a Sergeant Major. Being DOS-based, it looks a little long in the tooth, but is nevertheless worth taking a look at.

PCW Rating

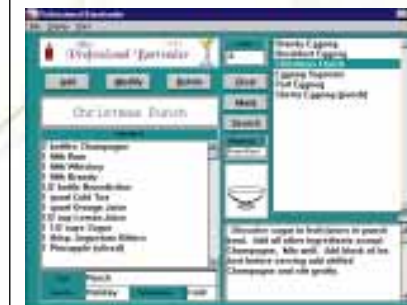


PC Bartender for Windows

PC Bartender for Windows is another basic shareware program, but it does what it's supposed to do and couldn't be simpler to use.

It has three uses: it provides you with a database of cocktail recipes, lets you enter new recipes or modify existing ones, and it has a neat feature that enables you to convert and adjust the

Cocktails



Top Complete Bartender's Guide: *basic, unexciting, but lots of recipes*
Middle PC Bartender: *just pick a drink from the list or add a recipe of your own.*
Bottom Professional Bartender: *probably the most accomplished (note the line-drawing of the appropriate glass)*

amount of ingredients used. This latter feature is very useful if you are planning a party and want to mix up enough drinks for a known number of guests.

PCW Rating



Professional Bartender for Windows

This is the most accomplished of the three programs. The main screen has a list of drinks and you can find out the ingredients, the recipe, and general information such as the type of drink, temperature at which it should be drunk and the best season for drinking it. A neat feature that I really liked was a line drawing of the glass appropriate for each drink.

Searching is particularly good. You can search by liquor, liqueur, ingredient (such as drinks containing cream), by type of glass, season and drink

temperature. There are various printing options and, of course, you can modify existing recipes or add your own. The program comes with over two hundred drink recipes from cocktails through to beers (a lethal concoction called Depth Charge consists of beer and Schnapps), to soft drinks and punches. If you register, which costs about \$20, you get over 1,000 more drink recipes and full printed documentation.

PCW Rating



Professional Bartender for Windows

Only slightly less sophisticated than Professional Bartender, this lacks the comprehensive searching facility and the line drawings of glasses. However, WinBar scores by including over 1,000 recipes and the ability to tag the drinks you've tried.

PCW Rating



Beers

The Beer Homebrewing Guide (reviewed below) describes beer as "Nectar of the Gods. Juice of the sacred barley fruit". This seems to say it all, except to add that the tremendous growth in popularity of real ale is the result of the most successful consumer campaign in history. It is therefore difficult to understand why the commercial computer companies haven't jumped on the beer bandwagon with a beer guide.


All we have is a CD-ROM of beer recipes for the home brewer — but don't be too hasty to turn away! This is a seriously serious disc that any beer drinker would enjoy browsing through and which might even turn you into a homebrewer.

And why should you ever wish to brew your own? If you have ever sat in your garden on a hot summer's afternoon and taken a mouthful of a crisp, clean and fresh beer, you wouldn't need to ask. There's a huge variety of beers you can brew, from light summer ales to warming winter beers.

The Beer Homebrewing Guide

Written and compiled by Fred Lloyd, Barry Lyon and Monty Nelson — two enthusiastic homebrewers and one enthusiastic homebrew drinker — this must surely be the ultimate homebrewing guide.





Top *If this disc doesn't inspire you to start homebrewing, nothing will*

Above *A seasonal recipe*

The only thing that lets it down is that it is heavily orientated towards the US.

There are four main sections. “Brew” is an illustrated step-by-step tutorial to homebrewing. “Reference” is the home of lots of homebrewing reference material which, unfortunately, is American and of little use elsewhere in the world. However, the glossary is useful.

“Recipes” is the section most of us will head for first. The collection here is large and eclectic. There are two recipe collections, one called “The Cat’s Meow” and another called “Other” which consists mainly of a collection of recipes supplied by customers of California-based William’s Brewing, and reprinted in a newsletter. The Cat’s Meow is a collection of beer recipes drawn from numerous sources, including almost every recipe posted to the Homebrew Digest on the internet from the first volume until 1992, but as the authors observe: “Caveat Brewer — we don’t guarantee that the recipes will taste good, or even that they won’t make you violently ill.”

Nevertheless, just look at the range of beers covered: pale ale, lager, wheat,

steam, smoked, sour-mash, stout and porter, barley wine and doppelbock, herb and spice, fruit, scotch, trappist, brown and other ales, mead, cider and even a few of historical interest (most acknowledged as undrinkable).

Digests is a collection of articles from the world famous Homebrew Digest Internet mailing list. If you are familiar with on-line Threads, you’ll have a rough idea of what to expect here — enthusiasts exchanging advice, recipes and much else.

Overall this disc is of greatest use to UK users for the Cat’s Meow recipes, but enthusiasts generate excitement about their hobby and somehow this comes across from your computer screen to you.

PCW Rating



SUDS for Windows

SUDS is a comprehensive brewer’s cookbook and log program that’s grown from a simple effort by its author to bring some sense and order to his recipe and log notes. Using SUDS for Windows couldn’t be easier. First enter a recipe, which you can type in or import as an ASCII file, and it is the work of a moment to import recipes downloaded from an online service such as Compuserve.

Once you’ve saved the recipe, a dialogue box is opened in which you enter pertinent information about the recipe,

Suds for Windows: for the homebrewer who means business



“There is no bad beer: some kinds are better than others.” — German Proverb

such as the starting and finishing gravities, category (Pale Ale, etc) and method (i.e. Extract, Full Mash). Once you have a recipe, you can make log entries. The log detail screen contains a number of fields pertaining to a particular batch of the selected recipe. These include: Date Started, Date Bottled, Starting and Finishing Gravities, and Hop IBUs. There’s also an area where you can make notes.

The program has some shortcuts built-in to make entering the information easier. The log screen gives you access to really useful tools such as the HOP IBU spreadsheet to calculate hop IBUs for beer batches — IBU stands for International Bittering Units, a world-wide standard of bitterness measurement based on hop isomerisation (it says here!) — and a basic beer label printer. SUDS for Windows comes with several recipes to get you started and there is a glossary of terms in the Help files.

SUDS is a typical shareware product: it was designed to satisfy the specific needs of its author and has grown into a solid but basic utility that goes straight to the heart of the beer brewer. There’s no gloss or glamour here, no pretty pictures, not even very many free recipes. It’s a simple tool to make the homebrewer’s life easier. And it’s yours for a nominal registration fee of \$15.

PCW Rating



As I don’t have any homebrew, I’m off to the pub. Have a happy Christmas and New Year and, raising a glass — bottoms up!



Product	Category	Company	Phone	Fax	CD/Floppy	Price Guide
The Beer Homebrewing Guide	Beer	Public Domain and Shareware Library	01892 663298	01892 667473	CD-ROM	£24.00 (inc VAT)
Complete Bartender's Guide	Cocktails	Public Domain and Shareware Library	01892 663298	01892 667473	1 floppy	about £6.00
The Interactive Wine Guide	Wine	World Library	01993 778077	01993 778246	CD-ROM	£14.95 (inc. VAT)
PC Bartender for Windows	Cocktails	Public Domain and Shareware Library	01892 663298	01892 667473	1 floppy	about £6.00
Professional Bartender For Windows	Cocktails	Public Domain and Shareware Library	01892 663298	01892 667473	1 floppy	about £6.00
Suds for Windows	Beer	Public Domain and Shareware Library	01892 663298	01892 667473	1 floppy	about £6.00
Wine Cellar	Wine	GST	01480 496666	01480 460206	1 floppy	£19.95 (inc. VAT)
Wine Guide	Wine	Microsoft	01734 270001	01734 270002	CD-ROM and disk	£29.99 (inc VAT)
WinBar	Cocktails	Public Domain and Shareware Library	01892 663298	01892 667473	1 floppy	about. £6.00
Wines of the World	Wine	Koch Media	01252 714340	01252 711121	CD-ROM	£ 49.99

DRILLER THRILLER

“Drill Down” is the key feature of accountancy packages in the nineties, and one software firm has caused a furore by registering a trademark for the term. Treading carefully through the exploding invoices, David Carter assesses the field.

A few months ago, a storm broke out in the normally staid world of accounting software. Under the noses of their competitors Bournemouth-based vendor SBS Financial Systems registered a trademark for the name “Drill Down” to describe its Exchequer accounts package.

Drill Down has long been recognised as the key characteristic that will distinguish accounts packages designed in the nineties from those of the eighties, so the news that one vendor had grabbed exclusive use of the term caused outrage in the industry. The lawyers have been hard at work ever since but because, as with most industry buzz-words, each supplier tailors the definition so they can claim that only their software qualifies, it's difficult to pin down what the argument is about. To help clear up some of the confusion, PCW decided to test ten of the major mid-range packages on the market to see how they measured up in the Drill Down stakes.

Accounting software — the big problem

Why is Drill Down so important? Basically, it's important because it tackles the most glaring defect of traditional accounting packages, which is that YOU CAN'T GO BACK. While accounts packages may be fine at transaction processing (printing invoices, processing orders, producing accounts etc), as soon as users want to analyse or browse through the transactions they have put in, sooner or later they run into a brick wall. The

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problem derives ultimately from lack of disk space, which until recently was limited and expensive. Package designers had to economise on it, so they dropped invoices off the ledger after they were paid, or posted summary details of the originating transactions to the nominal ledger, which were printed out as an “audit trail”, then wiped off the disk. This made for fast processing and minimum storage requirements, but if users wanted to go back and have another look at the original transaction they couldn't, either because it wasn't there any more or, if it was, it was now in a different form.

Larger disk storage capacities mean that this constraint no longer applies. Several years' transactions can now be

held live on file, in full detail, for as long as you like. Faster processors and better file management programs like Btrieve allow vast quantities of data to be quickly accessed via multiple keys and cross-referenced relationally to associated transactions. So the stage is set for a new type of accounts package which allows users to roam around (i.e. Drill Down) their accounting database without hindrance and gain quick access to all that precious management information that hitherto has been locked away in impenetrable data files. But it's a slow process and old habits die hard. As this review shows, established vendors are still churning out new packages that are obsolete the day they are released.

The three faces of Drill Down

There are many definitions of Drill Down, but at the end of the day they all fall into one of three headings — Drill Down; Drill Around; and Super Drill Down. We'll take a look at each in turn:

● Drill Down

You have a list of yesterday's sales invoices on-screen. The typical value of your invoices is one or two thousand pounds, but this time you see that one of them is for £255,041. You decide to investigate. If you have a Drill Down system, all you have to do is to highlight the suspect invoice, then press Enter (or click with the mouse) and the full detail of the invoice, as it was originally entered, is displayed onscreen. So in this case you might see that the operator had got the decimal point in the wrong place and the

PCW Coin Photography by David Whyte



invoice should have been £2,550.41. So you need to raise a credit note and issue a fresh invoice.

This is basic Drill Down — the ability to select any transaction in a list of orders, payments, invoices, stock movements etc. and explode it so as to see the detail of the original document underneath.

Drill Down should also work in reverse (a sort of Drill Up). For example, if you are looking at a list of advertising expenses in the Nominal Ledger, and one looks suspiciously high, it should be possible to highlight the item and display in detail the original purchase invoice or nominal journal source document. Or if you are doing a stocktake reconciliation and the stock balance of one item is way out, you should be able to list all the movements of the stock item in question and highlight any one to show the original detail of the delivery note, works order, stock transfer, stock write-off etc.

● Drill Around

Drill Down allows you to move within the detail of a single transaction. But you need to be able to move sideways too. For example, while in the middle of entering a sales order from a customer over the telephone, you might want to jump out of Sales Order Processing to look at the customer's outstanding invoices in Sales Ledger, or to go into Sales Analysis to see what price he paid for this item in the past, or to check on the forward availability of the item in Stock Control. Although the information might be held in these separate modules, it should be possible to "hot-key" instantly across them to access the information, then return to entering the order. And when you have jumped across to the other modules, you should be able to drill down to individual transaction detail. So, enquiring on work in progress may show that further supplies of an item are due in tomorrow, but drilling down to the detail of the works order shows that they haven't even taken the raw materials out of stores yet.

Speed is of the essence when taking telephone orders, so when you jump into Sales Ledger to look at the customer's account, you want to jump instantly to that account. If you want to jump into Stock Control to look at outstanding orders for a stock item, you want to jump instantly to that stock record on file. The advent of relational file managers such as Btrieve makes this possible. Records can be relationally linked so the operator doesn't have to perform a search. The

sense of all that precious data is a hot topic in the industry at present. This is not the place to discuss data warehousing, OLAP (online analytical processing), MDA (multidimensional analysis), data-mining and suchlike, but suffice it to say that to give managers the big picture you have to raise them above the individual transaction level and give them summaries and totals. Whereas an accountant's idea of a report is the "audit trail" (i.e. a listing of transactions with the total at the end) managers need the exact opposite. Information should be presented on-screen in the form of totals, with the facility to "zoom" down to look at individual transactions only if an out of line situation occurs.

This is called Super Drill Down. To visualise how it works, suppose Month 10 of your financial year has just ended and you are looking at the Profit and Loss account. Advertising expenditure this month was £4,900 and year-to-date £90,000 against a budget for the year of £50,000. How do you find out what went wrong?

With traditional systems you have to print out a listing of all the transactions for the year and start searching. However, with a Super Drill Down package you first make a screen enquiry which displays, not a list of transactions, but the individual monthly totals for each month of the advertising account. This allows you to identify instantly the month when the variance occurred. Suppose it was June. You can now highlight the June balance, press Enter and a list of all the advertising expenses for June appears. Scan the list to find the overspent item, then Down Arrow to highlight it and press Enter to display the original invoice in detail via conventional Drill Down. In an instant, via Enter and the Arrow keys, you have moved from the top of the data pyramid right to the bottom.

Drill Down proper, is really a two-step process: Super Drill Down from monthly totals to a list of transactions, then "ordinary" Drill Down from a transaction listing to the details of the individual invoice. Using only the mouse or Arrow keys, it's so quick and easy that even senior management can do it. But of course, for Super Drill Down to be really quick, the monthly balances need to be sitting there "online" before you even start the enquiry. As a rule of thumb, the more online monthly balances a package holds, the better it will be at providing management information.

GLOBAL 3000

TIS Software is a subsidiary of the Misys Computer Services Group, one of the UK's largest computer companies. The name Global 3000 harks back to the package's predecessor, Global 2000, but in fact this latest version is a modern package, having been completely rewritten and runs under both DOS/Novell and Unix.

At £9,930 for a seven-user system, Global 3000 is one of the more expensive packages in this survey, but all modules are multi-currency, multi-stock location and multi-company as standard. Most Global 3000 installations have between five and 50 terminals, with a large proportion of them in specialist Distribution and Telesales.

TIS has recently added a GUI option to Global. A screen painter sits on top of the system allowing senior management to access the data in Windows while operational staff can continue working in character mode. The "Integrator" facility allows you to transfer data from Global into Excel or Access, then back again via OLE. For example, you can take your Nominal Ledger budget figures out of Global 3000 into Excel, amend them, then reload them into Global.

Global 3000 is reasonably good at Drill Down: you can list the transactions on a customer's account and explode down to the original invoice (curiously, although you can choose to see All, Current or Archived invoices on this enquiry, you cannot simply see Outstanding ones). You can list a daybook of past invoices or sales orders on the screen and explode any of them to see the original detail but you cannot drill down from a list of product transactions. The Nominal Ledger only allows drill down of a sort, in that it shows the nominal analysis of the originating journal but not the full detail.

Global was good at providing plenty of monthly totals in the Nominal Ledger and Stock modules. These were available at both group and individual account level. Unfortunately, though, it was not possible to drill down to the underlying transactions. Nor could we find any enquiries showing monthly sales by customer (the test results for Global and the other packages in this survey are shown in the table on pages 136/137). However, Global's "Sales History" module should be mentioned: this is a sort of mini data warehouse which posts invoices and

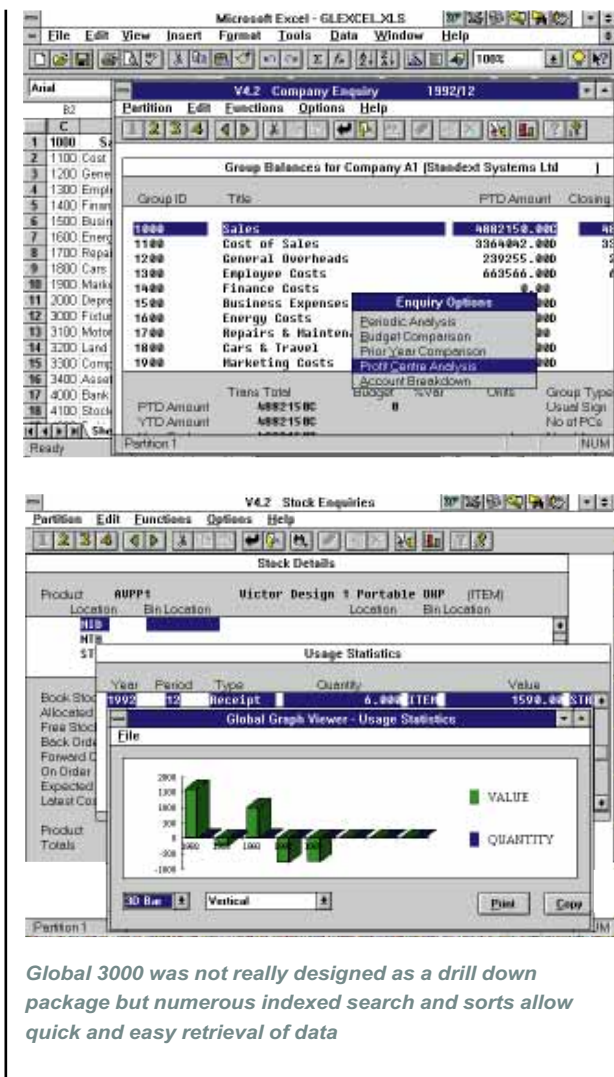
orders overnight, placing indexes on them to allow analysis later.

Global 3000 performed particularly well in the interactive order processing test. You can pre-set up to nine partitions running different jobs simultaneously and jump instantly from one to another rather like Alt-Tab in Windows. So, if you are in the middle of entering an order and get a credit warning, you can put the order on hold, jump straight to another partition which is running the customer account enquiry program, take a look at this customer's details, then hop back to where you were originally in the sales order.

So, in a telesales environment, you might set up the main partition for sales order entry: one for customer account enquiry, one for product enquiry, and another for customer sales history enquiry. While entering the customer's order in the main partition, you can jump instantly to other partitions to see the customer's outstanding invoices, future availability of a product, what the customer paid for the product last time, and so on.

This all worked pretty well, the only limitation being that when you jump to another partition Global doesn't immediately take you to THAT customer or THAT product and you have to do a Find operation to retrieve it, but the fast movement around the modules was impressive nonetheless. In addition, TIS has indexed many of the fields in transaction and master files, allowing immediate on-screen views of the data without having to close down the screen and load another menu option.

To sum up, Global 3000 was not really designed originally as a drill down package, but one feels that TIS has worked hard to make it seem so. The



Global 3000 was not really designed as a drill down package but numerous indexed search and sorts allow quick and easy retrieval of data

screen layouts are attractive, movement around the system is fast, via multi-partitioning, and TIS have introduced numerous indexed searches and sorts which allow quick and easy retrieval of data.

PCW Details

Global 3000

Price £9,930

Contact TIS Software 01628 532565

Good Points Good Drill Around (jobs can run simultaneously in multiple partitions). Fast data retrieval via indexes.

Bad Points No Super Drill Down from period balances to underlying transactions. Cannot create a new transaction by copying and editing a previous one.

Conclusion Good solution for companies requiring multi-user Distribution and Stock Control; especially telesales operations.

Dynamics

Dynamics, developed by US company Great Plains Software, is marketed in the UK by Kewill Systems. Under development since 1990, Dynamics was one of the earliest Windows packages. Five years and \$30 million later, three Ledgers, Stock and Sales Invoicing modules have been rolled out. Sales Order Processing was released in July 1995 and Purchase Order Processing is scheduled for early 1996. At £1,200 per module, Dynamics is aimed at the upper mid-range of the market. There are 150 users in the UK.

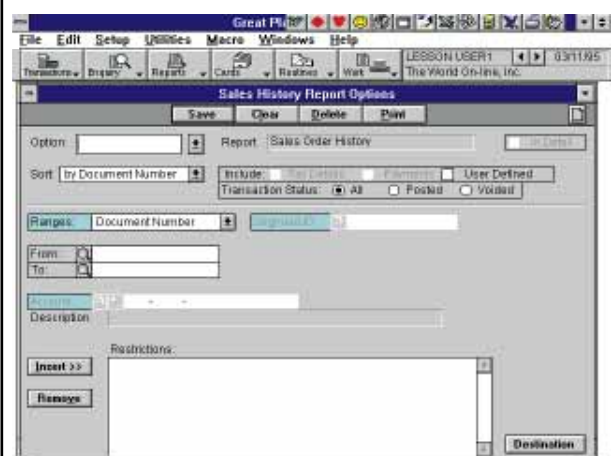
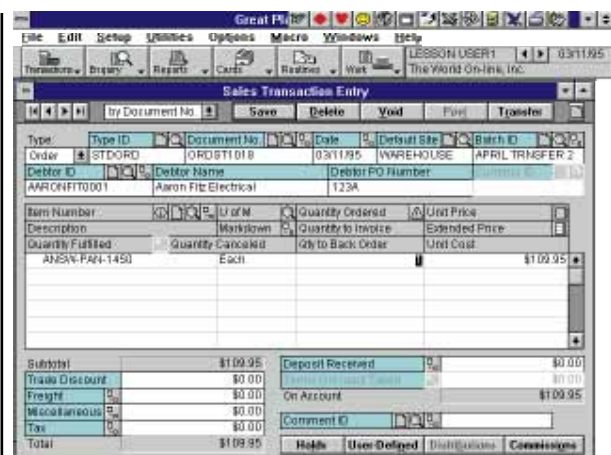
Dynamics acquitted itself well in our Sales Invoicing test. Drill down in particular is excellent, with the ability to display the original detail of virtually any source transaction. This is a particular strength of many Windows packages. When it came to super drill down from period totals to the underlying transactions, things were more variable: the Nominal Ledger offered monthly totals with the ability to explode down; the Product Sales history screen offered monthly totals but no drill down; while the Customer Sales enquiry showed just one month's totals with no drill down. In Sales Order Processing things went less well. The basic design looks impressive, with an interesting facility to predefine different order types via templates (Great Plains are very keen on templates, the idea being that it reduces the number of errors and the amount of time spent entering new transactions). But when in the middle of the order the customer ran over his credit limit and we went out to the customer's account to see outstanding debt and orders, we found that there were no details held of outstanding orders.

Similarly, when we ran out of stock on one of the items being ordered, and wanted to check availability in detail, it was possible to move to the product record from within the order, but there was no record on the product file of the outstanding orders for this product. It seems that the recent release of Sales Order Processing is very much a first stab and Great Plains have not yet got round to linking sales and purchase orders to the customer and account records. It was a little disappointing, too, that while you can auto-reverse a transaction via the "Void" facility, you cannot then correct the transaction by copying

and amending the original. You have to key it in all over again. Nor can you auto-reverse an invoice to automatically produce a credit note.

Nonetheless, it was clear that on Drill Down and Drill Around the basic design of Dynamics was pretty good, and doubtless these deficiencies will be made good. As to speed, earlier releases of Dynamics were slow, but a 486/66MHz with 12Mb of memory is now ample. On data entry, Great Plains allows you to tailor the Enter and other keys so you can work via the keyboard rather than via mouse, but odd things still happened. When I made a mistake on data entry, the cursor had disappeared when the screen cleared and it was not clear where I was. When we tried to scroll via the Down arrow through a list of nominal codes the highlight got left behind and we couldn't select the nominal code we wanted. The excellent Drill Down and Drill Around features can only be operated via the mouse, not the keyboard.

The overall look and feel of Dynamics is attractive. Screen prompts have a light blue background to distinguish them from data entry fields — a small point, but one which makes busy screens so much easier to read. The screen modifier allows you to "paint" the fields within a screen and customise it to your own needs. The one serious defect we noted was that each item line of a transaction seems to spill over onto two lines of screen display; in Sales Order Processing it needs three! Multiline displays are extremely difficult to read. I'd prefer to see a single line per item with a central pop-up window to accommodate the additional fields.



Top *The three-line order entry screen in Dynamics is not easy to read*

Bottom *Monthly totals from Dynamics are good; but it would help if you could drill down to the underlying transactions*

PCW Details

Dynamics

Price £12,295

Contact Kewill Systems 0193 248328

Good Points Very good Drill Down and Drill Around facilities. Screens can be customised to user requirements via Modifier.

Bad Points Single transactions running over two or three lines of screen are difficult to read. Very limited Order Processing at present.

Conclusion A mature Windows interface. A good, if relatively expensive, choice for the corporate user who wants a Windows-based accounting system, but decent Order Processing and Stock Control look about 12 months away.

Opera

Pegasus, Sage and Tetra Pegasus are the three best-known companies providing accounts software in the UK. The Pegasus "Senior" package was for many years the top-selling modular accounts package in the country. In 1993, the company introduced its successor, Opera, which is written in Foxpro, the development database now owned by Microsoft. Opera is available in both GUI and character-based versions, and users are able to work in either mode simultaneously, on the same data.

The most obvious thing that strikes you about Opera is its attractive, modern appearance, complete with menu options from a pull-down menu bar at the top of the screen. A key feature throughout is that the designers have tried to reduce operator keying time by providing templates containing standard information. For example, you can set up a series of Stock Item templates containing default nominal codes, VAT rates, suppliers and so on. When setting up new products you can choose to base them on a template. The result is less keying time and fewer errors in your product file. To save data entry time, instead of having to type in credit notes, you can recall the original invoice to the screen and Opera will reverse it to automatically create the credit note for you. However, there is no facility to copy a previous transaction and amend it to create a new one.

I've always found Opera attractive and easy to use with one exception; printing reports to screen. Since the reports are 132 columns wide and the screen only 80, you constantly have to scroll to the right to see the full detail. But the cursor keys under Opera are slow and jerky and navigation is long winded. All these problems would disappear at a stroke if Pegasus could take a leaf out of Lakeview's book and come up with a condensed 43 x 132 character SVGA screen display.

Opera offers limited Drill Down. In the Nominal Ledger you can see the monthly balances, then drill down from them to see the underlying transactions, then select a transaction and drill down to see an "image" of the detail. But this doesn't extend to the Product or Customer enquiries: these offer no monthly totals at all, although in Customer enquiry you can display a list of transactions (i.e. invoices and payments) and display the original

Date	Type	Ref1	Ref2	Stat	Debit	Credit	Balance
09/03/94	Inv	INVR187			42.56		
11/03/94	Inv	INVR113			352.27		
17/03/94	Alt	Disc 44	Discount			24.88	
17/03/94	Inv	INVR122	ADV 6789		139.69		
17/03/94	Inv	INVR186			55.79		
17/03/94	Cr	CRNR002				8.79	
17/03/94	Inv	INVR189			94.82		
24/03/94	Inv	INVR118	P/T 663333		69.53		
24/03/94	Inv	INVR111	PO 42155		126.12		
08/04/94	Rec	REC PNR	Cheque	3887		42.56	-42.56
08/04/94	Dis	DIS PNR		3887		8.79	-51.35
15/04/94	Inv	INVR157	665-88		391.45		
15/04/94	Inv	INVR158			45.79		
Tot Sales					42.56		
Tot Recs						8.00	
Unallocated Receipts						8.00	
Total						8.00	-51.35

Above A customer account enquiry screen in Opera. The neat VIEW2 option allows you to see which payment is related to which invoice, and to separate out the unpaid items

PRODUCT CODE	DESCRIPTION	UNIT	QUANTITY
87950	80001 PAPER CLIPS Small plain 10x100	Box	10
100165	LISTING PAPER 11 X 216 PLAIN 127		

Above Customer account enquiry again — this time using the Zoom option to see the image of the invoice

invoice image, although there's no ability to filter out paid transactions and show Outstanding invoices only. But this is all accounting information rather than sales information. Opera doesn't seem to offer any screen enquiries for either customer or product sales histories.

The interactive order processing test showed up further limitations. Opera has no facility to jump sideways to look at customer or product details while you are in the middle of an order. So if you are in this situation and the customer asks for a product which is out of stock, and you want to have a look at the current orders and future availability, all you can do is to close down the order, then choose the "Stock" option from the Sales Order Processing menu. Then, when you've found the information you want you close down the Stock Enquiry, re-open the sales order, return to where you were and so on. There's the same problem when checking on the customer account, with the added drawback that Opera credit checks only on the Sales Ledger balance and ignores orders in the pipeline. It's all far too long-winded and not really acceptable when other packages allow you to

do the job in just a couple of keystrokes.

So, a few black marks then. But one should not be too negative. The development environment of Opera is flexible and the data easily accessed. If Pegasus were willing to invest a bit of time to sort out these limitations, Opera should be able to match any of the competition.

PCW Details

Opera

Price £6,400

Contact Pegasus Software
01536 410044

Good Points Attractive, easy-to-use design with basic drill-down features. Alternative DOS/Windows interface under Foxpro.

Bad Points One-thing-at-a-time design means weak Drill Around between modules. Reports displayed to screen are difficult to read.

Conclusion Opera is a competent, attractive package that on this showing is not in the first rank — yet. But the underlying development environment is good and Pegasus is the only one of the "Big Three" established vendors to be taking Drill Down seriously.

Case Studies

Formac

When David France joined Formac — a distributor of PC and Apple Macintosh hardware and peripherals — as financial controller, he immediately realised that their accounting system had inadequate controls and stock tracking. Needing to implement a new system, he found Modulus to be the best product available.

As the stock module was being rewritten, he Beta tested and reviewed it, but waited to implement the full range of modules until September 1994. "We had a lot of input into writing the stock system," says France. "We ran the old system in parallel for three months, which gave us problems because Modulus was much more accurate than the old system, so we had problems reconciling them."

Formac is using the diary manager, stock control, sales order, purchase order, sales ledger, purchase ledger, nominal ledger, service control and data manager modules. There are 15 users, which is everybody in the whole building. Formac has been Beta testing new software since it first installed the system.

Diary manager is used by sales staff to control their calls and service control is used by Formac's technical support department. "With high-tech products, we have to be able to account properly for any returns," says France, "but each stock item can be tracked by individual serial number across 40,000 stock records."

"Modulus gives us better control of our business, because of the amount of detailed information available and the speed with which we can get at it. We know where everything is and everything that is happening. We can view information in any shape or form, at any point in time. For instance, we can see which customers we haven't sold to this month and give a report to the sales force."

"We would recommend Modulus to anybody. It is very simple, because there is only one integrated system. Life gets very complicated with more than one system. We wanted a system where we can look in by modem and see what is going on. Simon Warman-Freed — the managing director — and I



David France of Formac

can dial into Modulus and control the business when we are out of the office.

"With Modulus, I have total control of the business and an encompassing view of what the company and its staff are doing at any point in time. It is an all-seeing, all-knowing in-house system."

Contact: David France, Financial Controller, Formac, 0181 533 4040, fax 0181 533 2495

Avery Dennison

Avery Dennison (Ireland) is part of the Avery Dennison Corporation; leading manufacturers of self-adhesive labels. It is now in the second year of using TAS Books, a system it finds to be more than adequate. It was previously using System 36, linking two warehouses on separate sites by a telephone line. When this proved to be too cumbersome, the firm changed to TAS Books 2 on the advice of its IT department in the UK.

Personnel came from the UK to implement the system and train the users. The system currently has eleven users linked by a Novell network. All modules have been implemented and TAS Books is used for everything; including purchasing, stock control and sales. It is used by the sales department, stores and accounts.

"We find it an incredible system," says Ray O'Brien, Avery's warehouse controller. "It does everything we want to do and more. Reports are wonderful compared to those from the old system. It is

especially good for stock control, allowing us to use a perfect just-in-time system in the warehouse. We utilise pre-set reorder stock levels and quantities, together with automatic re-ordering. We use "low stock" and "product movement" reports, which are printed three or four times a week. By generating suggested orders, the system cuts down our workload. It is very user-friendly and it doesn't take new staff long to pick up."

"TAS Books 2 is very user-friendly with its integrated menus and modules," says Frank Morrison, Avery's finance manager. "The report generator is used frequently and is quite good. Once I had got the feel for it, while producing the first report, I found it very powerful. It is also helpful to be able to import our own stationery designs to use our existing stationery stocks. The ability to edit a transaction speeds things up and eliminates a great many correcting journals."

"We are also using TAS Books in our Cork plant in the same way that it is used in Dublin," continues Morrison. "It is sufficient for small and medium-sized businesses and is more than adequate for us and our users are all quite happy. Megetech is good with back up and support," says O'Brien. "Because the new system is so easy to use, all our staff

Ray O'Brien, Avery's warehouse controller



have more time to do other tasks."

Contacts: Ray O'Brien, Warehouse Controller, Avery Dennison, 00 353 1 623 3581, fax 00 353 1 626 6131
Frank Morrison, Finance Manager, Avery Dennison, 00 353 249 2301, fax 00 353 1 249 2864

Travco

Travco, a travel wholesaler selling hotel accommodation in Europe to travel agents, had been using a ledger supplied with its UNIX reservation software. "When I joined the company, I soon realised that it was awful," recalls Alasdair McGraw, Travco's systems manager, "so I quickly decided to replace it. I looked at a number of packages and liked the demonstration of Exchequer. It was intelligent and thinks the way human beings think. It also had the drill-down facilities which we needed."

McGraw had to recreate the first year's accounts in Exchequer, but since then Travco has implemented all the modules. Seven people have been using Exchequer all day every day for two years to enter data. "We have abused it and made mistakes, but the trial balance has always balanced, and in every case we were able to find errors very quickly," admits McGraw. "The Exchequer reports are very good and we have been able to spot errors and drill down to identify and correct the offending transaction."

McGraw finds that it is a great blessing to have all his historical periods open, although he needs to check the audit trail

very carefully to ensure that nobody has posted to an audited period in error. Travco also take groups of tourists around Europe, so they find the costing module is good for accumulating the costs of each tour.

"The whole system is transparent and gives us realtime information," says McGraw. "We have three years data available online and can drill down straight to any individual transaction. The search facilities are also good. We particularly appreciate the hotkeys if a customer telephones. They allow us to access one transaction to answer a query, while in the middle of entering another transaction."

"Exchequer's multi currency handling is superb. We are also able to use the fields in Exchequer to match our sales invoice with the corresponding purchase invoice from the hotel." Travco uses the stock codes during sales order processing, to provide analysis and utilise processing information. It is currently building import routines to bring orders from the reservation system into Exchequer, probably using Microsoft Access to match transactions with the ledger codes.

"We are very impressed with Exchequer," says McGraw. "SBS have been very good at support, and we receive updated software almost monthly, as improvements are made. Exchequer is running well under Windows 95. On a human level, Exchequer is very intuitive, although we are only using about half of what it can offer. Use of a good accounting system, such as Exchequer, has allowed us to cope with expanding rapidly to a turnover of £8 million."

Contact: Alasdair McGraw, Financial Controller, Travco, 0171 739 3333, fax 0171 739 2233

Alpha Dot

Alpha Dot is a manufacturer of large character inkjet printing machines for labelling cardboard cartons, which is currently turning over £2.5 million. It needed an accounting system which gave better support to the firm's manufacturing operation, which involves metal fabrication, integrated circuits and software. Its needs covered everything from procurement through stock control, manufacturing, sales, management reports, financial management and accounts.

"We needed total integration and

good reporting," said James Ward, commercial manager at Alpha Dot. "We liked Lakeview LM because you don't have to move around between modules. It seemed easy to use, because their hotkeys allow you to switch, say, from sales order processing to stock or procurement."

After training from Lakeview, Alpha Dot ran the new system in parallel with the old one until the end of its financial year. It has completed implementation and has been using Lakeview LM on its own for about four months. There are ten users on a Novell local area network with Windows clients.

"It's easy to move rapidly about the system," says Ward, "especially to look at a situation at a particular time, and it has a good report writer. Lakeview's support service is invaluable in helping to us optimise our use of the system. It's a powerful adjunct to their training."

"The system now runs the whole business. The screen layout is excellent and it is very user and key-friendly. Hotkeys reduce data entry time enormously, allowing us to copy an order and modify it, or copy an invoice as a credit note. Stock control is definitely a powerful feature. We have multiple locations, so we need tight control. Lakeview has allowed us to hold our stock levels constant while increasing our turnover. It allows us better control over stock items which are key to our manufacturing operation."

"Lakeview LM has flexible password protection, which is important because it gives each staff member the ability to work with and view the data they need. Lakeview will customise the system to meet any specific needs we have, so it is not a frozen design. With hindsight, good solid training was our best investment. After that, the system is easy to use when you first get in, with clear screens and well-defined fields. Even procedures which seemed difficult at first are easy once you have learnt them. Lakeview was a good choice because it allows us to maintain control of a growing business while increasing our overall administrative productivity."

Contact: James Ward, Commercial Manager, Alpha Dot 01264 781989, fax 01264 782017
Rod Newing

Rod Newing MBA FCA FInstD is a freelance journalist and a member of the IT Faculty at the Institute of Chartered Accountants in England and Wales.

Legend

Legend is the latest offering from Tetra, perhaps the UK's premier suppliers of PC-based distribution and accounting software to corporate and higher-range users. Tetra's top-end product for corporate users is Chameleon, running primarily under Unix. Legend was released last year as a slightly lower specification alternative to Chameleon, running under Novell. Recently, however, Tetra has ported it to run under SCO Unix and AIX. In a seven-user configuration, Legend costs £1,075 per module.

Although one of the newest packages in this test, Legend distinguished itself by having virtually no drill down features whatsoever. Even in the Nominal Ledger, usually the base point for incorporating drill down in a package, there is no facility to select a transaction from a list and explode it to see the original document in detail. Nor can you drill down from period balances to the underlying transactions: but since the only period balances you get are This Month and Year to Date, this facility wouldn't be of very much use anyway. It is a long time since I've seen such an inadequate Nominal Ledger and for a package released in 1994, at this sort of price, these limitations are inexcusable. This is very much an eighties design.

To be fair, Tetra's reputation has always been in distribution and manufacturing, rather than pure accounting. Entering one or two products and creating an invoice showed the wealth of facilities offered by Legend — batch traceability, serial number tracking and quantity conversion are all offered on well-designed, functional screens.

On-screen sales enquiries were basically very good, with the ability to see lists of daily orders or invoices, full details of past orders or invoices, and a line-by-line list of what each customer has bought and at what price. Everything is here; but it is all accessed via separate menus. Navigation would just be so much more slick and easy if everything was linked together in a drill down design.

One screen enquiry of particular importance was the Product Period Usage screen, which shows for each period both the demand and the sales. This is a vital point, ignored by so many vendors, who tend to offer sales figures only. If you are forecasting ahead for re-ordering purposes, you need to extrapo-

Legend 1.94

Legend Customers

Customer Code : 6884

Name : Robert's Motors Ltd.

Address : 10 West Avenue

Chislehurst

London

SE53 5UR

Post Code :

Alpha Code: 6888888

Telephone : 081-985-4035

Fax :

Telex :

BIZ :

Currency :

Language :

Carrier :

Delivery Method :

Settlement Disc. :

Discount Code : 688

Reminder Category :

Sales R/L Cat. : 688

Price List : 688

Spec. Price List :

VAT DETAILS

Reg No. :

Exempt No. :

VAT Ind. :

VAT type :

F1 exit, F2 browse, F3 contacts, F4 notes, F5 print, F6 copy details, F7 confirm, shift-F8 EC details

Above *Comprehensive sales and customer information can be called up, though access would be better if everything was linked in a drill down design*

Right *Monthly totals from Dynamics are good; but it would help if you could drill down to the underlying transactions*

Great PC

File Edit Setup Utilities Macro Windows Help

LESSON USER1 03/11/95

Transaction History

Sales History Report Options

Save Clear Delete Print

Option: Report: Sales Order History

Sort: By Document Number

Include: ☐ All ☐ Posted ☐ User Defined

Transaction Status: ☐ All ☐ Posted ☐ Voided

Ranges: Document Number

From: To:

Description:

Restrictions:

Insert >> Remove

Destination

late not from past sales, but past orders. After all, what if you were out of stock during the period?

Drill Around was fair. When entering a sales order, it was not possible to access the customer's account to credit-check in detail. However, Legend was good at providing product information, e.g. via the Predict Future Stock Availability screen which helps the operator give the customer accurate forward delivery dates. At the end of the sales order test, as part of which we had part-delivered an order and the customer had rung up, quoting his order reference and asking us to tell him the delivery note number, Legend rather fell apart. We couldn't find the delivery note anywhere, emphasising the lack of relational linking in Legend between all transactions relating to a single order.

For management information Tetra offers a link to Powerplay, an EIS package from Cognos. Tetra has mapped its record layouts to Powerplay, allowing simple, SQL-less, interrogations of the data. The result is that you can pretty well use Powerplay out of the box and it is very simple to use. Most people will buy Powerplay for sales analysis, at which it is very good (cross-tabs, pie-

charts etc), even automatically generating the analysis model from Legend's data records. But it does suffer from what is perhaps a fatal flaw — it only works on an extract of the data, rather than the original data records, so it's impossible to drill down from a balance to the underlying transactions because they aren't there. In the long-term I'm not sure that handing over all data analysis to a third-party package is the right solution, but if you need good sales analysis here and now, Powerplay is a good bet.

PCW Details

Legend

Price £7,270

Contact Tetra 01628 770939

Good Points Sophisticated order processing facilities.

Bad Points Mid-eighties design means that you can't browse and navigate through the data as with a modern package.

Conclusion Tetra's reputation and splendid functionality will carry Legend through for a year or two. But one morning Tetra's management will wake up to find that customers simply aren't buying this sort of package any more.

Exchequer



SBS Financial Systems set the cat amongst the pigeons earlier this year when it registered the trade mark for the name "Drill Down" in connection with its Exchequer accounts package. Poole-based SBS sells Exchequer via a small number of dealers and direct to end-users.

The package, like the company, is still young: SBS introduced Sales and Purchase Order Processing modules in 1994 and Report Writer and Costing modules in 1995. There is basic Bill of Materials but no Works Order Processing, so while Exchequer will suit a company that buys and resells things, it is not suitable for a manufacturer.

Exchequer is available in different versions. At entry-level you can buy a basic Stock, Invoicing and Ledgers system competing with Sage Financial Controller for £695 (this is for a single user). At the heavyweight end of the scale, SBS has a client-server version of Exchequer whose largest installation is a motor parts distributor processing around 250 orders a day on a 50-user system. The price of a seven-user, client-server, version of Exchequer worked out at £5,980. A dual interface DOS/Windows "Enterprise" version is due for release in February 1996.

While most vendors in this survey have bolted on Drill Down as a later addition to their original package, in Exchequer it is inherent in the original design. Select ANY transaction in a listing on the screen, press Enter, and Exchequer will display the originating document; not as some extract or image but in its original form (as it was entered). If you enter a sales invoice for a product to a customer, you can drill down to the original from all directions — from the nominal Sales account, from the Product record, or from the Customer account. This ability, when looking at any transaction anywhere, to be able to highlight it and display full details of the original is immensely helpful, especially if you have a query.

Exchequer offers super drill down as well, from period balances to the underlying transactions. Although this is good, it could be better. For instance, the more sophisticated packages in this survey show the true demand for a product in the form of monthly quantities ordered, but Exchequer shows only monthly quantities invoiced. It holds period balances for nominal and product groups as well as

Stock Code	Qty	Description	Unit Price	Disc	Total VMT
	1.0	Letterheads	458.000		458.00

Nominal Account	CC	Dept	Net Total	UNIT Total	Total
70810	Stationery & Printing		£ 458.00	78.75	528.75

The original invoice from Polished Printers Ltd for new letterhead appears in full detail. You've moved down from the top to the bottom of the information period in just a few seconds

individual accounts but unfortunately if you want to query, for instance, the June total for Administrative Expenses, it is not possible to drill down from this figure to see the June totals for the individual nominal accounts falling within the Administrative Expenses group.

Of all the packages tested, Exchequer was the fastest at interactive order processing and scored 100 percent for features. It required the minimum number of keystrokes to accomplish complex tasks. While in the middle of a sales order you can jump instantly to the customer's account using the F2 key and interrogate past invoices and orders. If a product is short of stock, pressing Shift-F10 takes you instantly to that product record in the stock file and pressing Return will display a list of due sales and purchase orders. Even though Exchequer does not calculate forward stock availability, the speed with which you can view outstanding sales and purchase order quantities generally compensates for this.

Considering that so much work is carried out interactively on-screen, Reports in Exchequer are actually a bit weak; there are numerous audit trails on the accounting side but little else. Fortunately, the introduction last year of an excellent relational Report Writer has remedied this.

Exchequer is still raw in some areas; notably Stock. For example, multi-loc-

tion stock is still not available and, with only one type of stock movement record, the handling of returns, consignment goods, loans, stock transfers and the like becomes awkward. But when all is said and done, in terms of overall design and ease of use this package is in a class of its own, allowing astonishingly fast movement throughout the data: sideways, downwards, upwards, anywhere. I have been installing Exchequer with my own customers for the past year and a half, and much of the genesis of this article was an effort to work out just why this package is so good. Considering an industry as over-hyped as our own one finds that, for once, the word is appropriate: "Exchequer" is a product of genius.

PCW Details

Exchequer
Price £5,980
Contact SBS Financial Systems
01202 298008

Good Points Lightning fast movement around the data. Multiple online balances with super drill down to transaction level.

Bad Points Minor, due to product immaturity.

Conclusion Third millenium accounting software which has arrived a few years early. Study it and learn.

Sovereign

Sage is perhaps the best-known supplier of accounting software in the UK, with its Sterling range having long dominated the entry-level marketplace. Having decided to move upmarket, Sage took over Sky Software in 1989 so as to acquire Sky's mid-range product, which was given the Sage treatment and re-launched onto the world as Sovereign. Pegasus Senior was top dog in the mid-range market at the time but, as Sovereign was in many ways superior, it made deep inroads into Senior territory and a couple of years ago could justly be said to be the premier mid-range package on the market.

However, that was two years ago and things have moved on a bit since then. In 1993 Pegasus introduced the successor to Senior. Opera is written in the Foxpro database, which is a Microsoft-owned product, so Opera is very much in the mainstream and can be linked to third-party products. Sovereign uses its own proprietary database and remains relatively standalone, although a new Windows version is planned, written in Visual Basic, which should allow links to other packages via ODBC drivers.

First impressions of Sovereign were rather good, with clear, attractive screens in the customary Sage green and red livery. Entering a new customer, order or product is rather neatly done: Sovereign asks if you want to create the new record from scratch or by copying an existing one. Setting up a sample product record showed a clear, well-designed screen with multilocation stock control as standard (although min/max stock levels for re-ordering were held at company level rather than by individual warehouse). However, these initial good impressions soon turned to frustration as it proved extraordinarily hard work to get back and enquire into the data. Sovereign appears to be an old-style "modular" design, whereby each module has its own version of a transaction and the versions are posted over in diminishing detail as the transaction progresses. So for example a purchase order will move through three "modules" as it is converted from a purchase order to a purchase invoice, which is then updated to the nominal ledger.

In an integrated, relationally designed package, enquiries on purchase order, purchase invoice or nominal account

The Stock Item/Customer Enquiry screen lets you see what each customer is ordering



Customer account enquiry in Sovereign allows you to see details of each invoice



would give you three different "views" of the one transaction. But in each module of Sovereign you can only view that module's own summary version of the transaction; you can never get back to the original.

Sovereign also lacked a Super Drill Down facility, that would allow you to explode a balance and display the underlying transactions. Perhaps this isn't surprising, but it was disappointing to find that multiple monthly balances are not held on any of the nominal, customer or product accounts. All you get are figures for This Month and Year to Date, which give no indication of trends. A complete blank then, on Super Drill Down, which is a pity because Sage have shown, with the VAT analysis capability of Sterling for example, that they are able to do this. In the interactive order entry test, Sovereign displayed no obvious means of jumping sideways into other modules while entering an order.

However, it is possible to set up the Alt key plus a keyboard letter to open up another menu option to run concurrently. This would have to be set up by a dealer, but it would allow a sales clerk to run order processing, customer enquiry and stock enquiry at the same time and to hot-key between them. This may be more

cumbersome to set up than other packages, but once set up, it will do the job effectively enough.

To sum up, Sovereign's lack of a Drill Down facility made it rather impenetrable, as you couldn't go back and browse through data. Although Opera also failed on quite a few of these tests, its basic design and the flexible development environment of Foxpro suggest that its defects can ultimately be put right. But in Sovereign's case we doubt whether its design will allow for any major improvements.

PCW Details

Sovereign
Price £6,500
Contact Sage Software 0191 201 3000

Good Points Attractive, well designed data entry screens.

Bad Points Modular design makes Drill Down back to original transaction impossible. Lack of multiple monthly on-line balances.

Conclusion Sovereign has an old-fashioned "modular" design rather than a modern "integrated" one. This is not a suitable platform upon which to build Drill Down features and speedy movement around the database.

Modulus Gold

Modulus Gold, produced by West London-based Vector Software, is one of the premier accounting packages for the Macintosh. Modulus is not a well-known name in the PC world but if traditionalists doubt whether it could come up with a serious accounting application, they can rest assured that Modulus Gold is a heavyweight contender, with just as detailed a feature set as any package in this group test. Vector introduced Modulus in 1993, after writing bespoke applications for larger Mac users. Modules include Sales and Purchase Order Processing, Ledgers and Job Costing, integrated with Diary Manager and Word Processing. Vector now has some 250 Macintosh users for Modulus including well-known names such as Mercury, Body Shop, and *AutoTrader*. Most installations average ten users per site.

The Windows version of Modulus was introduced in October 1995. Vector says a 486/66 with 8Mb of RAM is a reasonable hardware specification, particularly if you're running the client/server version. The cost for a seven-user system worked out at £7,000, with four days' worth of installation and training thrown in. Drill down from transaction listings to original document was excellent, as Modulus retains all transactions in their original state. Windows makes this sort of feature so easy to implement, so Windows packages seem invariably to excel at drill down. Modulus' only defect was that it is not possible to drill down from within a list of product movement transactions.

Modulus was less good at drilling down from monthly balances to transactions. This is due to the basic design of Modulus, which is like a database. Transaction item lines are retained at the detail level and whenever you want to produce a report or enquiry, it is generated there and then from the transaction detail, rather than having been pre-calculated and held on-line. This sort of approach gives enormous analytical power in making enquiries but it does demand a fairly literate management accountant-type user to understand and make use of it because the user must first know how to generate the enquiry in order to get any figures.

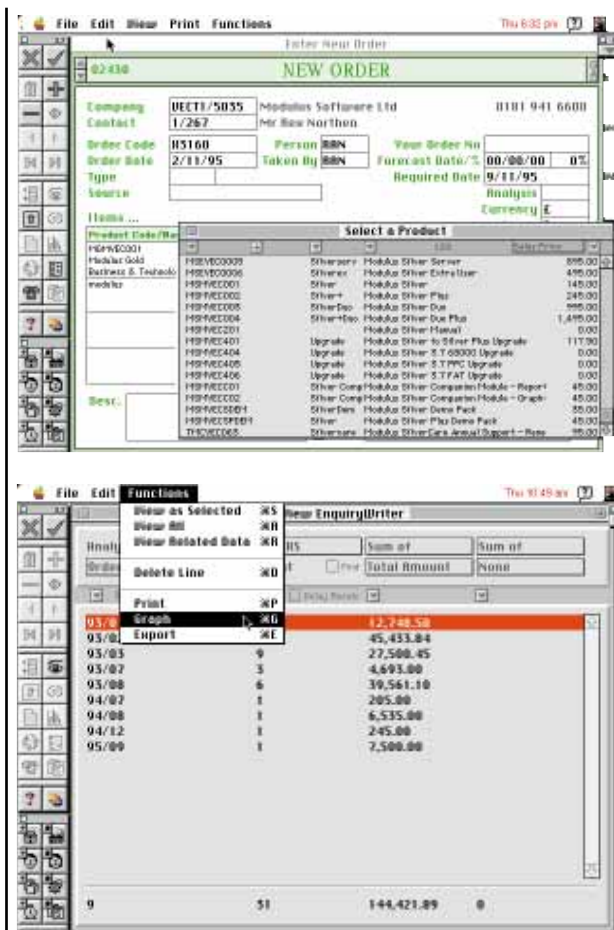
With the online balances approach, you just make the enquiry and there the monthly figures are, already calculated

for you. Similarly, with the database approach reports are freshly calculated and cannot get out of sync, but they take time to calculate as the machine trawls through thousands of transaction records. The online and database approach each has its advantages and disadvantages, but in my view management enquiries are made much easier and quicker by having the period balances online, already calculated.

When it came to interactive order processing, Modulus zipped through the test with ease. It was easy to drill across to view the customer's account. (Although this showed that credit-checking was faulty, taking regard only for the outstanding sales ledger balance and ignoring sales orders in the pipeline). Equally good was the facility to drill across to the product record if an item was short of stock. This was fortunate because when showing stock availability Modulus does not give an "OnOrd" total and you cannot see what is in the pipeline from suppliers — you have to go and look at the individual purchase orders. Curiously, Modulus has a three-line order entry screen just like Dynamics, but unlike Dynamics this was fairly easy to read (see visual), primarily because Vector uses different fonts to distinguish screen prompts from data fields. Nonetheless, I'm not sure I would recommend this to a company that wanted to process lengthy, multi-line sales orders.

Back-to-back ordering was also impressive with the ability both to generate a one-to-one purchase order (e.g. for a PC precisely configured to the customer's needs) or a many-to-one purchase order (where one purchase order is generated from the total of the day's sales orders). Stock control was also

sophisticated, with individual "stock types" indicating rental stock, consignment stock, loan stock, returns to supplier etc. Overall, order processing and stock control in Modulus was of a very high standard, far superior to its competitor Dynamics which lacks Purchase Order Processing and whose Sales Order Processing is relatively incomplete. Modulus is also a lot cheaper.



Top Like Dynamics, Modulus has a three-line order entry display; but this one is a lot easier to read

Bottom Modulus Gold is one of the premier accounting packages for the Macintosh

PCW Details

Modulus Gold

Price £7,000

Contact Vector Software
0181 941 6600

Good Points Excellent drill around in order processing.

Bad Points Lack of online balances.

Conclusion The clear choice for users who want a GUI-based system running order processing and stock control.

TAS Books 2

The original TAS Books was released in July 1991. It started life as a £399 package sold through dealers, but Megatech then changed its strategy, slashed the price to £99, and started to advertise heavily for direct sales in the PC press. Sales shot up and from nowhere TAS Books is now the UK's second-biggest selling accounts package after Sage.

Written under the Btrieve file manager, the original TAS Books offered basic accounts (ie sales, purchase and nominal ledgers, cashbook), together with product and service invoicing. TAS Books 2, released in 1994, added stock control, together with sales and purchase order processing.

The problem for vendor Megatech is that in TAS Books 2 it has produced a serious product quite capable of handling a major installation (Megatech itself is running a 26-user system with 400Mb of data). If sold through dealers, TAS Books 2 could retail quite honestly at £3,000-4,000. But TAS Books' name is in the high-volume, low priced, direct market so it is selling the product at just £999 per system, a fraction of the cost of the other packages in this review.

TAS Books 2 is very much a traditional stock control and order processing package, but offers a very decent clutch of features. Products can be regular, assembly or non-stock. As to pricing, there are quantity discounts with four break points and three customer price bands. Bills of material and serial number tracking are standard. Items can be marked as "commissionable" (Megatech is very keen on tracking salesmen's sales and commissions) or flagged as discontinued, so that they remain on file but don't clutter up the system. Spicer file import is standard.

Recently Megatech has added drill down to the accounting ledgers of TAS Books. You can now highlight any nominal, customer or supplier transaction and display the detail of the original posting. This is a great improvement, but like so many other vendors in this review it has not grasped the super drill down concept and so have done only half the job. Thus TAS Books 2 offers excellent monthly summaries of nominal, customer and salesman histories, but you cannot highlight a month and drill down to display the underlying transactions.

While analysis of customer and sales-



Above Order entry in TAS Books 2. Good, clear screens but you can't jump sideways Right Of all the packages reviewed, TAS Books 2 was best at analysing salesmen's performance. But there's no super drill down to underlying invoices

Code	Target	Sales	Cost	Margin	Commission	%Sales	%Prof
JUN	10000.00	10400.00	2010.00	7620.00	192.00	2.35	3.42
JUL	10000.00	10500.00	2500.00	7800.00	262.50	2.50	3.75
AUG	10000.00						
SEP	10000.00						
OCT	10000.00						
NOV	10000.00						
DEC	10000.00						
JAN	10000.00						
FEB	15000.00						
MAR	15000.00						
APR	15000.00						
MAY	15000.00						
YTD	140000.00	10930.00	6310.00	12620.00	457.50	2.42	3.63

man sales is very good in TAS Books 2, stock reporting is fairly basic. A monthly summary of sales and margin by product similar to the salesman summary would be welcome. The stock enquiry offers you the option to see outstanding sales and purchase orders separately, but no attempt is made to bring them together to project future stock balances. The low stock report does not sort by supplier and there is no attempt to generate suggested purchase orders.

The interactive sales order processing test showed up TAS Books 2's lack of drill around features. When entering an order you are warned that the customer is exceeding his credit limit (orders in the pipeline are ignored) but you cannot go and look at the account in detail. Similarly, if you are short of stock you can only see the totals of stock available, on back order and purchase order; there is no opportunity to look at the individual orders and see the delivery dates.

However, if you want just to bang in batches of sales orders from pre-written order sheets, and there is need to simultaneously jump around to check credit accounts or forward stock availability, then TAS Books will suit you down to the ground. It has been carefully and thoroughly written, with plenty of good touches and is quite worthy to stand against other packages in this review if

you want a simple batch-oriented stock control and order processing system without frills.

The low price of TAS Books 2 is very attractive, but may cause problems.

Will users be willing to pay the £2,000 to £3,000 consultancy necessary to get it properly installed when the product itself only costs £999? TAS Books 2 should offer a niche to larger companies with experienced IT staff who are looking to install a cheap but effective order processing and stock control system in a department or subsidiary.

PCW Details

TAS Books 2

Price £699

Contact Megatech 0181 874 6511

Good Points Reasonably good drill down. Strong analysis of salesman performance.

Bad Points At the price, none. Low price may result in a lack of skilled consultancy support to install TAS Books 2 properly.

Conclusion Solid, dependable, traditional design at a ridiculously cheap price. Perfectly adequate for many users who have paid five or ten times as much.

Navision

Navision is a name that's new to this country, but is well known in Scandinavia and 13 other countries, where over 24,000 copies have been sold. First released in 1990, the product is developed by PC & C A/S, a Danish company with a 10-year history in writing business and accounting software. Navision was introduced to the UK in May 1995 .

Standard modules available are the three Ledgers, Stock Control, Bill of Materials, Invoicing, Sales and Purchase Order Processing, Job Costing and Resource Control. The target market for Navision is mid-range and installations can vary from a single-screen standalone application up to a large-scale network. Navision is very competitively priced and a seven-user system worked out at £4,700 in the DOS version. A Windows version has just been introduced, which costs about 40% more.

Navision's mainly light blue or black screens show the considerable influence of DOS versions of Lotus 1-2-3, circa 1989. It looks a bit boring, really, but once you get into it you find out what a truly remarkable package Navision is. A key feature is the ease with which it can be tailored to individual needs. Just dip into the Design menu, and you can make extensive changes from data tables without the need for writing any programming code.

Each Navision application consists of various types of objects which you design, such as reports, screen windows, menus and tables. The objects are executed by an "object interpreter" which is built into the Navision Development System and handles the interface with the computer's operating system. All the application objects you create will automatically run under DOS, Windows, Unix or OS/2. While the creation of new objects would really be the province of the professional, non-technical but computer-literate users can modify and adapt existing objects for themselves. Anyone who has mastered a Report Writer or written a simple database program should be more than capable within Navision of painting their own screens, setting keys to fields for sorts, and adding fields to screen enquiries.

Navision scored very highly on the interactive order processing test and Drill Around functionality is exceptional. When interactively entering an order you can

interrogate both the customer's account and the product record in full detail. Navision jumped straight to the specific customer record and specific product record in both cases — a sign of good quality. It also credit-checked on a line-by-line basis as each order-line was added, rather than wait till the order was complete.

Super drill down is provided by the "Trendscape" facility which is to be found in all modules, and which analyses transactions into user-definable "time buckets". For example, the "Availability" Trendscape in Stock Control is a screen enquiry which takes the current balance of a stock item, then adds incoming quantities from purchase orders, and outgoing quantities from sales orders, to give a closing anticipated balance at the end of each period. You can choose to display the results analysed by day, week, month, quarter or year.

Normally, one would fear that on a live system it might take too long to trawl through all the transactions, but in order to analyse data across multiple dimensions the Navision database has its own "SIFT" (Sum-Indexed Flow Technology) specialised technology which is designed specifically for speedy analysis and output of business information. The Navision demonstrator told me, hand on heart, that with 60,000 transaction records the response would still be nearly instantaneous.

Navision has extremely powerful analysis features. Once the Trendscape has been calculated you can highlight any period total, and display the transactions that make it up, in any View you wish. It is then possible via the "Navigate



Top A superb "Trendscape" screen showing future stock availability by day, week, month, quarter or year
Bottom Navision's Design menu allows you to set up your own screen layouts, keyed fields etc., without any need for programming code

Document" option to drill down still further into the originating transactions. Our only complaint is that, while Navision will calculate for you, say, a Group Sales figure for June in the Nominal Ledger, drilling down on the total will show you a long list of all the June transactions for every account within the group. But you don't want this — you want to have the June totals of each individual account. Similarly, there is no serious attempt to consolidate sales at a Product Group level and drill down to the products within that group. But nonetheless, this is a terrific piece of software.

PCW Details

Navision

Price

Varies, according to module, from £1,100, to £8,750 for complete core version; £300 per additional user.

Contact

Navision UK 0181 446 1458

Good Points

Very easily customised. Top quality Drill Down features. Objects work on any platform.

Bad Points

Nothing serious.

Conclusion

Functional appearance hides a state-of-the-art package.

How we did the tests

We tested each package by running through a series of sales orders and purchase orders.

The first test was to enter a straightforward batch sales order. Having posted and printed the final invoice, we checked what information had been posted to the customer, product and nominal sales accounts and what screen enquiries were available to show this information.

We then entered a purchase order and posted a second sales order. This time we tried to check, while in the middle of entering the sales order, the customer's outstanding invoices, past sales, and the current and future stock position of the item being ordered.

Comparative results are shown in the table on pages 136/137. In addition, we checked on other valuable features of a Drill Down package: the ability to automatically reverse or void a faulty transaction ("auto-reverse"); the ability to auto-reverse a sales invoice in order to create a credit note; and the ability to create a new sales invoice or order by copying and editing a previous one.



Editor's choice

Two packages in this review belong to an older generation. Tetra's Legend, despite its fine functionality and a release date of 1994, is really a backward-looking package. Sovereign from Sage looks very attractive but proved quite impenetrable. TAS Books 2 holds its own with the rest and provides extraordinarily good value. It's very similar to Sovereign in terms of function, and if you order in batches rather than interactively and you don't need multilocation stock and multicurrency, then it's a fine, cheap package.



The best of the established dealer-supplied products was Global 3000 from TIS Software. Its multiple partitions made it especially good at interactive order processing. At a lower price level, Pegasus OPERA is very attractive but Pegasus need to take a leaf from TIS's book and get the modules working concurrently on the order processing side. Both products offer a combined DOS/Windows interface.

For those who want a GUI-only solution, we preferred Modulus. Like so many Mac packages, it makes its Windows competitors look a bit unwieldy, but the real problem with Dynamics is that its Order Processing and Stock Control capabilities remain incomplete.

Definitely the dark horse in the group was Navision from Denmark, which has just been released in the UK. Uniquely customisable, running on DOS, Windows or OS/2 and with its amazing Sift Trendscape facility, this is a terrific package.

At the end of the day, though, the editor's choice goes to two packages — Lakeview LM3 and Exchequer from SBS Financial Systems. We found it impossible to choose one over the other. Exchequer is the more radical design, but Lakeview is generally more mature, especially in manufacturing. Both packages are superlative and a delight to use, particularly for the experienced user. Once you've mastered either of them any information you want seems just a keystroke away.

Do Windows accounting packages have a future?

The Windows development environment is ideal for Drill Down — it's an area where Windows accounts packages put most of their DOS and Unix competitors to shame. Windows' ability to run multiple sessions concurrently makes it a natural at Drill Around as well. And the arrival of Windows 95 at last brings a robust operating system capable of running mission-critical accounting applications. So are traditional character-based accounts packages about to go the same way as character-based word processors? It may seem so, but one major obstacle remains. Before you junk your existing accounting system and sign up for that Windows package, sit down at the keyboard and try entering half a dozen transactions. Then the awful truth hits you — data entry under Windows is a disaster area.

Typically, an accounting screen displays a dozen or so fixed fields into which data has to be keyed. There's no formatting, only the task of moving from one field to the next. Pick up the mouse, click on a field, put down the mouse, type in the data, pick up the mouse again, click on the next field, type in the data — you soon realise that this is impossibly slow and to get up any sort of speed you've got to forget the mouse and use the keyboard shortcuts. But all of those specialised keys on the PC keyboard — the double size Return key for entering data into each field, the Arrow keys laid out in the inverted T, the Escape key at top left for exiting out of a screen — Windows ignores them all. So instead of the Up arrow to go back a field, you have to use Shift-Tab; instead of

Escape it's Ctrl-F4; and the Return key doesn't enter a field any more but saves the whole screen.

With obscure or finger-wrenching key combinations for common tasks, no type-ahead facility for the experienced user, and a cursor that's either pencil-thin or non-existent so that often you lose track of where you are on the screen, user productivity drops dramatically. The training department of a major bank found that: "Under the old text-based mainframe our Bought Ledger clerk used to enter around 200 purchase invoices a day. With the new Windows package she manages 120."

Whether or not this limitation is permanent, it is incontrovertible that operators work more slowly under GUIs. Realising the problem, most vendors are now coming up with client/server solutions whereby the user interface is distinct from the underlying application, so that both text and GUI interfaces are available. Operating staff whose primary task is data entry can work in text mode keying in orders and payments, while analysts and managers who need to use data extraction and analysis tools can work in GUI mode — both working simultaneously on the same data.

The argument is that this gives you the best of both worlds. While purists may complain with some justice that it doesn't really give you proper Windows, the combined text/Windows interface does seem to offer the obvious solution — analysts and management get the benefits of the GUI, but operating staff are not penalised.

ACCOUNTING SOFTWARE TABLE OF FEATURES					
	Global	Dynamics	LM3	Opera	Legend
Product Vendor	GLOBAL 3000 TIS	DYNAMICS Kewill	LM3 Lakeview	OPERA Pegasus	LEGEND Tetra
Operating Platform	DOS/Win	Win	DOS	DOS/Win	DOS
Price SPOP, Stock & Ledgers, 7 users single location, single currency	£ 9,930	£ 12,295	£ 8,750	£ 6,400	£ 7,270
DRILL DOWN					
The facility, from a list of transactions displayed on the screen, to select one and see the originating document in full detail.					
Nominal Account Enquiry	○	●	●	●	○
Customer Account Enquiry	●	●	●	●	○
Product Account Enquiry	○	●	●	○	○
Invoice Daybook Enquiry	●	●	●	○	○
Orders Daybook Enquiry	●	●	●	●	○
SUPER DRILL-DOWN					
The facility to call up on screen the monthly totals for an account, to highlight one month and see the individual transactions that make up the monthly total.					
Nominal Ledger Group - monthly values	●	●	●	○	○
Drill down to individual N/L accounts?	○	○	●	○	●
Nominal Ledger Account - monthly values	●	●	●	●	○
Drill down to transactions?	●	●	●	●	○
Product Group Sales - monthly values	●	○	●	○	○
Drill down to individual products?	●	○	●	○	○
Product Sales - monthly values	●	●	●	○	●
Drill down to individual invoices?	○	○	●	○	○
Product Demand - monthly order quantity	●	○	●	○	●
Drill down to individual orders?	○	○	●	○	○
Customer Sales - monthly values	○	○	●	○	○
Drill down to individual invoices?	○	○	●	○	○
DRILL AROUND					
The facility, while reviewing or entering a transaction, to move sideways and see related transactions within other modules from within a sales order.					
Access this customer's account record	●	●	●	○	○
Access this customer's account record via a single keystroke	○	●	●	○	○
View individual transactions on this customer's account	●	not orders	●	○	○
Access this product's account record	●	●	●	○	●
Access this product's account record via a single keystroke	○	●	●	○	●
View quantities delivered to date and outstanding	●	●	●	●	●
View related sales and purchase orders	●	○	●	○	●
View related delivery note(s)	●	●	●	○	○
View related sales invoice(s)	●	●	●	○	○
COPY/EDIT AND AUTO-REVERSE TRANSACTIONS					
Auto-reverse transactions?	●	●	●	○	○
Auto-reverse invoice into a credit note?	○	○	●	●	○
Copy an invoice and edit	○	○	●	●	○
Copy an order and edit?	○	○	●	○	○
KEY ● Yes ○ No					

ACCOUNTING SOFTWARE TABLE OF FEATURES					
	Exchequer	Sovereign	Modulus	TAS Books 2	Navision
Product Vendor	EXCHEQUER SBS	SOVEREIGN Sage	MODULUS Vector	TAS BOOKS 2 Megatech	NAVISION Navision
Operating Platform	DOS	DOS	Win/Mac	DOS	DOS/OS/2 /Win
Price SPOP, Stock & Ledgers, 7 users single location, single currency	£ 5,980	£ 6,500	£ 7,000	£ 699	£ 4,700
DRILL DOWN					
The facility, from a list of transactions displayed on the screen, to select one and see the originating document in full detail.					
Nominal Account Enquiry	●	○	●	●	●
Customer Account Enquiry	●	●	●	●	●
Product Account Enquiry	●	○	○	○	●
Invoice Daybook Enquiry	○	○	●	●	●
Orders Daybook Enquiry	●	●	●	○	●
The facility to call up on screen the monthly totals for an account, to highlight one month and see the individual transactions that make up the monthly total.					
Nominal Ledger Group - monthly values	●	○	●	○	●
Drill down to individual N/L accounts?	○	○	○	○	○
Nominal Ledger Account - monthly values	●	○	●	●	●
Drill down to transactions?	●	○	○	○	●
Product Group Sales - monthly values	●	○	○	○	○
Drill down to individual products?	○	○	○	○	○
Product Sales - monthly values	●	○	○	○	●
Drill down to individual invoices?	●	○	○	○	●
Product Demand - monthly order quantity	○	○	○	○	○
Drill down to individual orders?	○	○	○	○	○
Customer Sales - monthly values	●	○	○	●	●
Drill down to individual invoices?	●	○	○	○	●
DRILL AROUND					
The facility, while reviewing or entering a transaction, to move sideways and see related transactions within other modules from within a sales order					
Access this customer's account record	●	●	●	○	●
Access this customer's account record via a single keystroke	●	○	●	○	●
View individual transactions on this customer's account	●	●	●	○	●
Access this product's account record	●	●	●	○	●
Access this product's account record via a single keystroke	●	○	●	○	●
View quantities delivered to date and outstanding	●	●	●	●	●
View related sales and purchase orders	●	○	●	○	●
View related delivery note(s)	●	○	○	○	○
View related sales invoice(s)	●	○	●	○	○
COPY/EDIT AND AUTO-REVERSE TRANSACTIONS					
Auto-reverse transactions?	●	○	●	optional	●
Auto-reverse invoice into a credit note?	●	○	●	●	●
Copy an invoice and edit	●	○	●	●	●
Copy an order and edit?	●	●	●	●	●
KEY ● Yes ○ No					



Crystal gazing

As 1996 looms, the **PCW** star-gazers cast the bones to take a light-hearted glimpse into the future. What will the new year hold?

Read on...



Bewitched Ben Tisdall's prophecies for the industry

● **Novell spends two or three months looking for someone to buy WordPerfect**, but strangely, the company which was worth \$1.4 billion a year before is now worth absolutely nothing. Novell lays off developers and buries hundreds of tons of unwanted copies of Novell Office in a land-fill site. Residents of the houses that are later built on the site complain that the ground is "unstable" and it's all too easy to "crash" through the surface.

● **The difficulties for UK PC manufacturers increase.** They have to pay through the nose for Microsoft Office while the big US operations (without mentioning Dell or Gateway) get it for practically nothing. Microsoft's share of the Suites market moves sharply into the nineties and several UK-based PC assemblers go into receivership. There's a glut of cheap, rather tatty, warehouse space in north London and the home counties.

● **A senior IBM executive admits that OS/2 is finished.** IBM issues a press release to explain that he meant "completed", not "ended". The same week, Microsoft announces it has sold 30 million copies of Windows 96.

● **In the summer, IBM/Lotus pulls the plug on Lotus SmartSuite** and says its "strategic direction is to concentrate on

Lotus Notes". US start-up, The Lite Fantastic, releases WordLite, a \$19.95 word processor which uses the Word file format. Microsoft sues, but in a matter of weeks, millions of copies have been sold on the internet.

● In the autumn, the CD-ROM market collapses. A senior industry analyst says: "Books are better and cheaper. It costs hundreds of thousands to develop good CD-ROM products but consumers won't pay more than £15 per disk." Intel releases the 200MHz Pentium. Prices for Pentium 90MHz PCs dip below £800 and Sainsbury's and Tesco start selling PC games.

● Just before Christmas, Microsoft sells its 60 millionth copy of Windows 95 and puts in a large bid to acquire Symantec. The bid is referred to the FTC. Adobe buys Macromedia. IBM buys The Lite Fantastic and promises to bundle WordLite with both the copies of OS/2 Warp it expects to sell in '97.



Prophetic PJ Fisher's prospects for the internet

Next year is very definitely shaping up to be the year of the browser wars as the world wide web takes over the world. The scene becomes just a little confused, however.

● **Everybody goes HTML extension crazy** and no-one's browser extensions will work with anyone else's. To make matters worse, all the players start jumping into bed with each other at the same time just to hedge their bets. Sun, Netscape and Adobe are all quite cosy

until Browser Bill forces himself on all three with a quite enormous extension.

● **It's April, and rumours are flying** that logging on to the Microsoft Network automatically deletes any copies of any Netscape, replacing them with Microsoft Explorer. To prevent re-installation of Netscape, MSN also downloads software that detects Netscape, and formats your hard disk if it does.

● **It's summertime and the British Microsoft, BT, surprises everyone** by launching its own internet service with, surprise, surprise, it's own web browser and some exclusive new extensions. Still no sign of its Video On Demand service, however, as it says that future development will concentrate on the web.

● **Silicon Graphics announces a new web browser** and easy-to-use programming language. It's this year's Java-type sensation and everyone says that Hot Java is finished. In August, IBM launches a new browser for OS/2 Warp but nobody notices.

● **By Autumn, Bill Gates, disturbed by the number of formatted hard disks** around the world, tells a conference that the internet is all junk and not worth logging on to anyway. "The only extension I'm interested in is the one to my house of the future," he says. Apple is delighted to see four more people subscribe to eWorld.

● **It's November, and Netscape announces Version 8.0.** It has extensions that switch on the TV, take the dog for a walk and spread peace and love around the world. In desperation, the ISO HTML Standards Committee resign *en masse* and opt for something easier.

● By the end of the year, there's real-time everything: real-time music, real-time video, real-time confusion. Though not, of course, any real-time profits. But, you know, it's early days. The four new eWorld subscribers cancel their subscriptions.

PCW Mystic Photography by Tony Barratt



Clairvoyant Chris Cain sees what's in store for Apple

Tonight's winner is connected to the number six, has a black cat, a gold lamé shell suit and... Oops! Sorry, wrong crystal ball.

● **A typically headstrong Aries, Apple sees mixed fortunes** just as it did in 1995. There's no let-up in the demand for PowerMacs and overall turnover figures increase. But profits crumble significantly as prices are forced down to keep products competitive.

● **Software is the all important area for Apple in 1996.** In much the same way as PC users embraced Windows 95, PowerMac owners take to Copland, the new 95 percent PowerPC native version of MacOS, like ducks to water. It arrives late, has many new features and claims to run in 8Mb, but you really need 16Mb and virtual memory to run more than one application. Apple apologises, saying its calculations are performed on Pentium processors following Microsoft guidelines. Microsoft retaliates with a new, even slower version of PowerMac Office.

● **Apple makes tremendous strides with cutting edge technologies**, including interactive video and video-conferencing. These have their thunder stolen by cheaper, less original solutions for WinTel PCs with better marketing and smaller memory requirements. QuickDraw 3D has the edge for longest, but Apple shoots itself in the foot by producing a Windows version.

● **The best-selling Apple product is not a Mac** but a Pentium version of the DOS add-on card. A 200MHz 604+ based Mac is launched towards the end of the year, and both PCI PowerMac clones and Common Hardware Reference Platform (CHRP) machines arrive from famous manufacturers. MacOS then faces a strong challenge by Windows NT for dominance of the latter.

● **Relationships continue to be a problem** thanks to that Aries independent streak. Nothing changes.

Soothsayer Simon Rockman divines chips and systems

● **In the first quarter, Intel announces that the Pentium Pro will be available**

soon. When it's pointed out that this was promised for the fourth quarter of 1995, Intel states there has been a slight slippage and they will now be available in 1995 — but in the *fifth* quarter.

● **Microsoft ships Chinese language version of Windows 95** on the basis that the Chinese new year is in February. Someone in Seattle starts work on the Hebrew version — he's got until September.

● **In the Spring, Intel struggles with Moore's Law.** Having worked hard to persuade people that the rule of chip power doubling every two years actually meant the price of a system halved every two years, the company finds that Pentium Pro machines are slower when measured using Intel's own iCOMP benchmarks. Intel scraps iCOMP and goes back to using the FOR...NEXT loop system pioneered by PCW in 1982.

To hit the half-price target, Intel drops the processor price to less than that of Pentium but finds that as you need 32Mb RAM and a fast cache, the machines are still too expensive.

This leaves the way open for AMD to clean up with the Nx586, but AMD can't get the chips out of the only factory that can make them, the IBM fab, because IBM is too busy making M1s for Cyrix.

● **By the summer, Cyrix finds that it can't sell any M1s** and so can't pay its bill to IBM. IBM buys Cyrix. Intel and IBM lock horns over a patents issue and an injunction is put on all chips. No new computers are made, at all.

● **Nintendo launches the Ultra 64** which has more graphics processing than any video card, and high-speed, high-capacity, magnetic storage. An enterprising boffin in Cambridge builds an Ultra 64-to-PC interface, to allow the Nintendo to be used as a backup device and accelerator for Windows 95. Thousands of businesses buy Nintendos. National productivity falls to a lower level than in Christmas '93, when Doom was first released, as businesses across the land unplug their Nintendos and play the Ultra 64 version of Super Mario.

● **With no new computers and millions of Nintendos in the country,**



the Japanese company launches a keyboard for the console. Microsoft ports Windows 95 to the MIPS4000 used in the Nintendo and the console takes over the computer industry. Well, stranger things have happened.



Ethereal Eleanor Turton-Hill predicts databases and software development

I see a 32-bit frenzy looming... Hold on a minute, it's disappearing... No, no wait, it's back again... Ah, I can see it more clearly now... It's waving... No it's not — it's drowning.

● **Windows 95 developers throughout the land rush, like lemmings,** to inject their applications with some 32-bit "goodness", but like most software development projects, it turns out to be a long, frustrating and painful process. Those companies who decide to take the first step towards 32-bit happiness provide plenty of entertainment for those who don't, and a surprising number of businesses take the sensible option of doing nothing at all.

● **Those companies who go forward with the Windows 95 plan** begin to grasp the enormity of it all — it's not going to be the party they had first imagined. They are tormented by hardware incompatibilities, and increasingly everyone becomes aware of the tragic similarity between PCs and Cabbage Patch dolls. Each one has a unique combination of hardware components as well as applications, drivers, and fonts, and all of these are, as yet, untested under the new OS. The mere thought of transforming custom-built 16-bit apps to better, faster, 32-bit versions sends IT departments into a state of apoplexy.

● **The advantages of 32-bit code on Windows 95 continue to be thrashed out** in the computer press, and businesses continue to analyse the benefits they might be missing, or those they're striving to achieve. In vain, they repeat the words to themselves over and over again: "multithreading", "flat addressing", "improved stability", but only



a privileged few reach the final state of 32-bit nirvana. The rest become hopelessly dependent on teams of hack programmers who patch each other's patches, play with each other's objects, and alter each other's code in a million and one entangled ways.

● **Someone roots through Microsoft's Win32 SDK** and discovers a handy little tool, PORT.EXE, which scans their source code and helpfully informs them that their porting problems are greater than the total number of atoms in the universe, but the essential solutions can be narrowed down to 14,534,567 instances of 16-bit keywords and 6,578,932,199 references to third-party DLLs.



Crystal-gazing Clive Akass looks into the destiny of notebooks

● **Notebook vendors fight off several law suits** brought by users suffering slipped disks and arm strain.

● **Meanwhile, a new breed of true mobiles** with wireless communications (infra-red and cellular telephone) experiment with novel forms of human-machine communication such as redesigned handwriting and speech recognition.

The mobiles run for days on cheap AA batteries, or rechargeables, and rely on easy desktop connections for storage. This leads to a growing demand for a standard docking station and low-voltage DC power supply, allowing access to facilities in any up-to-speed office or home.

The new mobiles use cut-down clones of desktop applications and so are not tied to the Wintel platform. This represents a huge opportunity for small third-party software developers.

The mobiles use the workstation-class StrongARM Risc chip developed by Cambridge-based Advanced Risc Machines with Digital. Britain's own mobile maker, Psion, is also forced to innovate to maintain its world lead.

● **Novell struggles on looking for a purpose in life** until it joins with IBM in a bid to corner the world networks; a task at which Microsoft has signally failed. Happily, the networks are already too big to corner.

Seventeen million users sue

Microsoft for misrepresenting Windows 95 by not spelling out that they will have to upgrade their hardware and applications software in order to reap its benefits. Microsoft, ordered to pay billions in compensation, collapses. Bill Gates gives up in despair and retires to Ulan Bator to grow tomatoes.



Star-gazing Gordon Laing peers out at graphics and DTP

● **Early in the year, six and eight-speed CD-ROM drives are superseded** by the first 16-speed drives — the world's fastest yet. Within a month, the 16-speeds drop below £150 in time for the world's fastest CD-ROM drive yet again, this time 32-speed, although early tests indicate the processor grinding to a halt under the strain, the PC case melting under the heat, and a near fatality when a disc was accidentally ejected while still spinning.

● **The standard hard disk starts the year at 1.5Gb, but doubles in capacity**, while halving in price every three months. By the end of the year, most PCs will still be unable to cope with a complete installation of Microsoft Office and CorelDraw for Windows 96.

● **As RAM prices fail to fall, they replace the gold bar** as the universal standard unit of currency. Paranoid users, worried about memory theft, force RAM manufacturers to replace the parity chip on a SIMM with a global positioning system (GPS) device. Linked to a Psion Series 3a running AutoRoute 96, victims of theft will experience few difficulties in tracking down the culprit.

● **Quark, author of the XPress DTP package**, suddenly realises how appallingly rude it has been to the press and to its customers. To make amends, it provides reasonably-priced upgrades, less buggy code and review copies for journalists — just like every other software manufacturer in the world.

● **Corel continues to remorselessly swallow up other developers' products** for inclusion in Draw version 7. It will ship on 14 CDs, consist of 27 unique modules, include 4,000 fonts and

37,000 pieces of clip-art, and will arrive late with approximately 50 percent of it not working, to be followed by a seven-CD bug fix four weeks later.

● **At some point in the future, plug and play will operate seamlessly**, although perhaps only in a parallel universe. Visitors to this alternative plane also find high-definition televisions and PCs which run well under 4Mb in every home — and that CorelDraw is the most popular and best established graphics package on the Macintosh.

Highlights from the births, marriages and deaths columns of Personal Computer World in 1995

Births

- To Microsoft, a new graphical operating system, Win95, after a long and painful gestation. Dark questions about whether the father was Apple's Mac operating system.
- To Intel, a 150MHz Pentium Pro, the first of the sixth-generation processors. Born into a more uncertain world than its forbears, as software becomes more platform independent.

Marriages

- Lotus and IBM. Wedding of the year. The bride wore a yellow SmartSuite. Blushing ever-the-bridesmaid was Apple, whose name has long been linked with IBM (though a bigamous marriage is still not ruled out).
- Aldous and Adobe. Marriage of leading graphics specialist left problem of what to do with the squabbling children, Freehand and Illustrator. Freehand eventually went to AltSys, its mother by an earlier marriage, who sold it heartlessly to Macromedia.
- AMD and NextGen. A marriage of convenience. Major chip cloners unite in the face of the might of Intel. First child, to be called K6, expected next year.
- Symantec and Delrina. Utilities giant takes on the Canadian.

Marriage that wasn't

- Engagement of Microsoft and Intuit called off after objections when the banns were read out. People said they were only marrying for the online money market.

Separation

- Novell announced that it planned a divorce from WordPerfect, only weeks after admitting publicly that it was ending its furtive romance with high-roller Unix, of which there had long been talk of a love child. Novell claimed it was renouncing all ties to concentrate on its self-proclaimed task of networking the entire world.

Deaths

- Photostyler. Strangled by stepmother Adobe, who did not want it upsetting her daughter, Photoshop.
- Commodore US. Looked like a case of adios Amiga, until Escom bought the intellectual rights to the machine which will be sold in Eastern Europe.

Near-death experiences

- Modem pioneer, Hayes, under Chapter 11 protection, spoke repeatedly of saving angels coming into sight down a long, bright tunnel.

Be your own oracle

Do any readers have better predictions for what may happen in 1996? Just write between 300 and 500 words and send it in on disk, or by email, to the addresses on the letters page. We'll print the best submission and cross your palm with silver.

1995 — What happened, and when

January

● **Intel** reels from the discovery by the improbable Professor Tom Nicely that the new **Pentium** can get its sums wrong. Boss Andy Grove tactlessly points out that Intel has known about the bug for months, and that anyway, users should expect a new chip to make mistakes.

Intel first says it will replace only "mission critical" chips — meaning those that might cause air crashes, or world wars. European marketing manager, Tom Keating, says: "We want to talk to people who design aeroplanes."

There is global uproar. Intel agrees to replace all flawed chips.

● Portly **Philippe Kahn**, last of the great spenders, resigns as president of **Borland**, the company he founded. No doubt taking a weight off their minds.

● Microsoft's new graphical operating system, codenamed **Chicago**, has already been renamed **Windows 95** to help us forget that it was promised for 1994. Launch date "before July".



February

● **Windows 95** now set for launch "in August". IBM gloats that sales of its rival **OS/2 Warp** operating system are booming as a result. Cynics say the real reason is that sales are being encouraged by PC makers to persuade Microsoft from getting too outrageous over Win95 pricing.

● Meanwhile, thousands of printers are roughed up by scrubbers as **Hewlett-Packard** becomes the latest company to be hit by a bug. The scrubber pads are fixed to a contraption designed to fit on best-selling inkjets (DeskWriter 510 and 520, and Deskjet 550C and 580C) to re-texture paper-feed rollers which have lost their grip.

March

● People queue to sue Microsoft as the Win95 bandwagon gathers pace. Some complain of monopoly abuse and there are fears that **Bill Gates** will use Win95 and his new Microsoft Network to muscle in on global inter-networks. **Apple** accuses Microsoft of pirating **QuickTime** code.

● The **Business Software Alliance** reports that 349 people have called a "Shop Your Boss" hotline to report companies using unlicensed software. Only half were motivated by the £2,000 reward, according to the BSA; the rest were worried that Bill Gates was not getting all his dues. Not one malicious call — aren't people nice?

● The original rubber ball, **Phillipe Kahn**, comes bouncing back with his **Sidekick**, the organiser software that made Borland's name and is now sold by Kahn's new company, **Starfish**. Borland is doing rather well, too, launching **Delphi**, a Pascal-based visual programming environment.

April

● A survey reveals that one in five French men prefers to play with a PC than with a woman. It doesn't say what they do with their PCs. Perhaps we've been mishearing all along: not Latin lover, but La Tin lover.

● **Phone Day**. British Telecom's conspiracy to confuse computers, has database users all over the country amending their records. Those who protest that BT does not need new numbers are

told that the exercise is a trial run for the millennium, when a lot of PCs and software will refuse to recognise the 21st century.

● **Gates** says the August launch of Win95 is "not guaranteed" due to persistent buglets.

May

● **Compaq**, stung by the introduction of cheap removable mass-storage devices from Syquest and Iomega, announces a new super-floppy drive that will read both 100Mb disks and standard floppies. But not yet. Denying accusations of vapourware, desktop marketing chief Kevin Bohren says: "We are shooting for the fourth quarter." Watch this space.

● German vendor, **Escom**, buys the Rumbelows chain and starts to transform it into 200-odd high street PC shops. IBM is delighted because Escom's PCs, targeted at first-time buyers, are preloaded with, guess what? Cue mystified callers to **PCW**: "What's all this about Warp? Is it German? Is it safe to eat?"

● **IBM** spokesman **Brad**

Chase says Win95 is set for a 24 August launch "barring a major problem."

June

● **Lotus** chief, **Jim Manzi**, is "devastated" to be told of a hostile takeover offer from IBM five minutes before it is announced. Six days and \$3.5 billion dollars later, he welcomes the deal — and, presumably, the fact that he is personally \$35 million the richer for it. "We are excited about being able to work with IBM," he says.

● A group of PC vendors in the US file fraud suits against Microsoft for claiming that Win95 would run in 4Mb of RAM. But of course, Microsoft didn't say how fast it would run...

● The **Department of Justice** ponders accusations of unfair competition in Gates's plan to bundle a Microsoft Network connection with Win95 (though both **IBM** and **Apple** offer similar deals).

July

● **IBM** Global Network chief, **John Whiteside**, admits: "We have lost the battle for the desktop interface." And Win95 has not even shipped yet.

Lots of people are still trying to stop it, with anti-monopoly officials still sniffing at that network connection.

● Microsoft promises to provide a list of products that will not work with **Windows 95**; instead, it produces a list of ones that will. No point in spelling out how many applications the punters will need to upgrade.

● **Novell**, still market leader in corporate net-operating software, is feeling the squeeze from Win95's big brother, **Windows NT**. Novell president, Bob Frankenberg, hopefully describes a proposed blend of the best of **Novell Netware** and **Unix** as the "network computing platform our customers will rely on into the next century."



August

● On launch day, Win95 makes it to BBC radio's **Woman's Hour** which is as close to blanket coverage as a software launch can get. Hitchhiker's Guide author **Douglas Adams**, in a *Guardian* front page review, dismisses it as a poor imitation of the Mac OS.

Seven million users who buy it over the next eight weeks discover that whatever else Win95 will do (which is a lot), it will not run their existing applications faster than Win 3.11, nor will they get those nice long filenames without application upgrades.

September

● The Microsoft Network arrives with a soft thud; a big anti-climax. **Access** is slow, features don't begin to match the likes of **CompuServe**, and internet connection is only a promise. If Gates reckoned on signing the world up to his network on the back of his \$200 million Win95 hype, he's blown it.

● **VNU Labs' tests** on Win95 code confirm that 16Mb of RAM is required to get a significant performance boost under Windows 95.

● A new form of virus, using self-replicating macros, is spread worldwide by a **Microsoft** technical CD. The payload consists only of the message: "That's enough to prove my point." And a considerable point it is too: the macros bypass all existing security, and can easily be altered to do damage.

October

● **Novell** sells off its **Unix** interests (see July) to concentrate on **Netware**. SCO and HP will continue to develop Unix but integrate Netware hooks.

Novell president, **Frankenberg**, unveils plans for a Smart Global Network that will talk to all major operating systems. He adds: "This is anathema to Microsoft."

● But the talk is of **Microsoft's NT** becoming increasingly platform independent. Intel president, Andy Grove, when asked about the opportunity this presents to other chip makers, says: "If we don't keep ahead of the competition, we don't deserve to survive."

● **Jim Manzi**, former **Lotus** boss, walks out after just 99 days working for new owner IBM. "I don't think I am the right person to be leading a division inside a much

larger organisation," he says.

November

● **Novell**, in yet another retrenchment under Microsoft's barrage, puts **WordPerfect** up for sale barely a year after buying it in a \$1.3 billion deal. A Win95 version of what was once the world's leading word processor is not expected until next year. But the big question is whether someone (such as IBM) will buy Novell.

● **Microsoft**, which once insisted that Win95 would run in 4Mb, finally admits that its **Access** for Win95 Professional Edition database needs 12Mb — which on many machines means installing 16Mb. Desktop product manager, Oliver Roll, in a statement of apology, says: "We hope you continue to have rewarding experiences with Microsoft Office."



Six
of the
best

Faster is usually better in the computer world so perhaps it's no surprise that six and even eight-speed CD-ROM drives are now on the market, although quad-speeds only ceased to be a novelty a few months back. **Gordon Laing** reviews six six-speeds and an eight-speed.

It was only a few months ago that we noticed quad-speed CD-ROM drives had suddenly become the standard, but even in this short time, quad-speed has become old hat. So what now? First we had single-speed, then double, then quad, so presumably this month heralds the arrival of eight-speed CD-ROM drives. Right? Well, kind of.

I was planning to shock you with the news that the next step up is the apparently intermediate one of six-speed. That was until Diamond squeezed in with the very first eight-speed, just in time for inclusion in this round-up, so I've considered the eight-speed separately for the purposes of this feature (see page 152).

So here we have six six-speed internal CD-ROM drives, all claiming to be half as

fast again as the average quad, which can be no bad thing, since in the computer business, fast is good. Or is it? In fact, there's more to it than just the six-speed aspect of these drives, so before making any recommendations we'll review other performance issues and consider why, other than speed, you would want a six, or even eight-speed CD-ROM drive.

I'm too sixy for my drive

The first question is surely: "Six times what, exactly?" To answer this we must return to the birth of the compact disc, when it carried audio only.

Sony and Philips laid down the specification for compact disc digital audio in what is known as the "Red Book". It stated that the stereo system

would employ digital sampling at a rate of 44.1 KHz with a 16-bit resolution. While this would at first appear to be a lot of information, 650Mb for an entire disc, the sustained data transfer was a modest 150Kb/sec; about the same as a floppy disk or a tenth of the average hard drive.

It didn't take long to realise the potential of a cheaply manufactured read-only disc with 650Mb of computer information, and the Yellow Book CD-ROM was born. The first CD-ROM drives read the information at the same speed as an audio player (150Kb/sec) later to be known as single-speed.

While audio discs must be read at single speed, there was no limit to CD-ROM. The faster you could get the data off, the better. Then the double-speed CD-ROM drive arrived, spinning the disc at twice the speed, and offering double the data transfer; typically 300Kb/sec.

Improved transports, tracking and error correction saw the inevitable introduction of the quad-speed CD-ROM drive delivering 600Kb/sec. With this improved performance, CD-ROM titles became easier to use, encouraging developers to increase the sophistication. As with the constantly speedier processor, this rendered older, slower, hardware obsolete or at best extremely frustrating.

Currently, quad-speeds are the standard, available for a little over £100 and fitted to most new PCs. If you take a look at the Pentium 120MHz group test on page 196, you'll see that all come with a fast CD-ROM drive. And although we originally asked for quad-speeds, several manufacturers supplied the increasingly common six-speeds, most of which are tested here.

Six-speed, it almost goes without saying, spins the disc at six times normal speed, theoretically delivering a sustained data transfer of 900Kb/sec, fast approaching that of a typical hard drive. So is that all there is to it? Just spin faster and faster and reap the benefits?

Unfortunately, none of the CD-ROM drives tested here even approaches the overall performance of a typical hard disk. In sustained data transfer from sequential sectors perhaps, but as soon as random access comes into play, the CD-ROM drive can't compete. This isn't to say they're a big con; just be aware that even with six or eight-speed you shouldn't expect overall hard drive performance.

Then there's the "processor hit" to consider. As CD-ROM drives speed up they place greater strain on the processor, and in some cases could have a negative effect. Some manufacturers have developed drivers to reduce this,

but it's worth bearing in mind before you have a total speed frenzy.

Application

Even though access times are poor compared to hard drives, and there is the potential for hard processor hits, fast CD-ROM drives make a big difference in... well, what exactly? The greatest speed difference is in pure transfer of data: copying files from CD-ROM to hard drive, the installation of software or operating systems, and accessing CD-based databases are all significantly improved with a faster CD-ROM drive.

Sadly, one application which appears to have found a performance ceiling is Photo CD. Kodak's image storage format holds a single image at five different resolutions, the top three being compressed, the largest of which, uncompressed, can measure a little under 20Mb. Now there's a system which would benefit from a faster drive, and indeed we found double-speeds opening twice as fast as single-speeds, and quads twice as fast again.

Then we tried the six-speeds, and found to our dismay that they were no faster than the quads. It would appear that the decompression and decoding of Photo CD image packs is limited by more factors than just the drive of origin, and even with a fast Pentium and plenty of memory, there is no benefit in having anything faster than quad-speed. So if you're only interested in Photo CD, anything faster than quad would appear, for the moment, to be unnecessary.

Installation

If only it were as easy as just plugging in a CD-ROM drive and getting on with life — well, it can be, but just what do you plug it into?

In the old days there was only SCSI, followed by the proprietary interfaces. Three proprietary interfaces crossed the boundary into standards, found subsequently on many sound cards, the idea being that a multimedia upgrade kit would only require one card. The three interfaces, compatible primarily with drives from that manufacturer, were Sony, Misumi, and Panasonic/Matsushita.

SCSI matured into SCSI-2 and the current alternative is the IDE interface. Every PC has a hard drive controller which with a little coercing, can also support a CD-ROM drive. The original IDE hard drive was designed for the AT bus. The IDE interface with its single channel could support two drives, and the later ATAPI specification allowed one of these to be an IDE CD-ROM drive.

Unfortunately, in the excitement few

bothered to notice that a CD-ROM drive sharing the same IDE channel as a hard drive would slow it down, particularly in Windows, where the precious 32-bit access was lost. This happens because Microsoft's driver looks for installed drives in the BIOS, only spots a drive C, gets confused when it notices interrupts from a mystery source and gives up.

The most popular solution is enhanced IDE (E-IDE) which offers two channels for a total of four drives. Pop your hard drive(s) on one and your CD-ROM drive on the other and have the best of both worlds. Or, go for SCSI, which could always support seven devices, internal or external, without any of these troubles. It also handles the job of multitasking better.

The technical bit

Once again, we've got six six-speeds: three from the E-IDE camp, and three representing the SCSI-2 side of things. All were fitted individually to the same IBM Pentium 90 with 16Mb memory; the E-IDE drives connected to a spare channel of the on-board PCI E-IDE interface, and the SCSI-2 drives to an Adaptec PCI 2940 SCSI-2 card.

The standard CD-ROM benchmarking suite of the VNU Labs was run on all drives, resulting in figures for sustained data transfer, processor hit, and weighted overall performance (see the table on page 152).

Plextor is the only drive here to use a caddy loading system: the other five, and the eight-speed too, use tray loaders. Plextor has retained the older method of loading CDs, arguing that it allows the drives to be mounted vertically. It also extols the virtues of having your most frequently used discs ready to go, pre-loaded in caddies, rather than suffer all the inconvenience of opening jewel cases (i.e. normal CD cases).

Apart from this, all the drives look much the same. They each require a spare 5.25in drive bay, suitable power and data connection, and that's it. All the front panels have headphone jacks and volume controls for audio use; all CD-ROM drives have built-in digital-to-analogue converters and automatically drop to single-speed for audio discs. Some of the more interesting drives may have basic CD audio transport controls such as track skip, but otherwise, one CD-ROM drive looks pretty much like any other.

There are many similarities in terms of performance and price. A six-speed drive should theoretically be able to deliver a sustained data transfer rate of around



900Kb/sec but only four of the six managed this. All three SCSI drives topped the 900Kb/sec mark, the clear winner being the Toshiba, boasting 968Kb/sec thanks to its slighter faster "6.7-speed". The model we reviewed was a pre-release version, but the final product, which should be shipping soon, is not expected to be any different.

Only one of the E-IDE drives cleared the 900Kb/sec mark: the Teac, which just beat the NEC 6Xi SCSI drive. The Aztech and Wearnes turned in relatively disappointing sustained data transfer rates of around 680Kb/sec. This ended up being very close to the various 4.4 and 4.5-speed SCSI drives we have tested from the likes of Pioneer, Toshiba, and Plextor (the latter is in *First Impressions* on page 64). But putting this into perspective, they were all comfortably faster than a standard quad-speed drive.

Conclusion

How do the prices measure up? As you've gathered, the CD-ROM drive

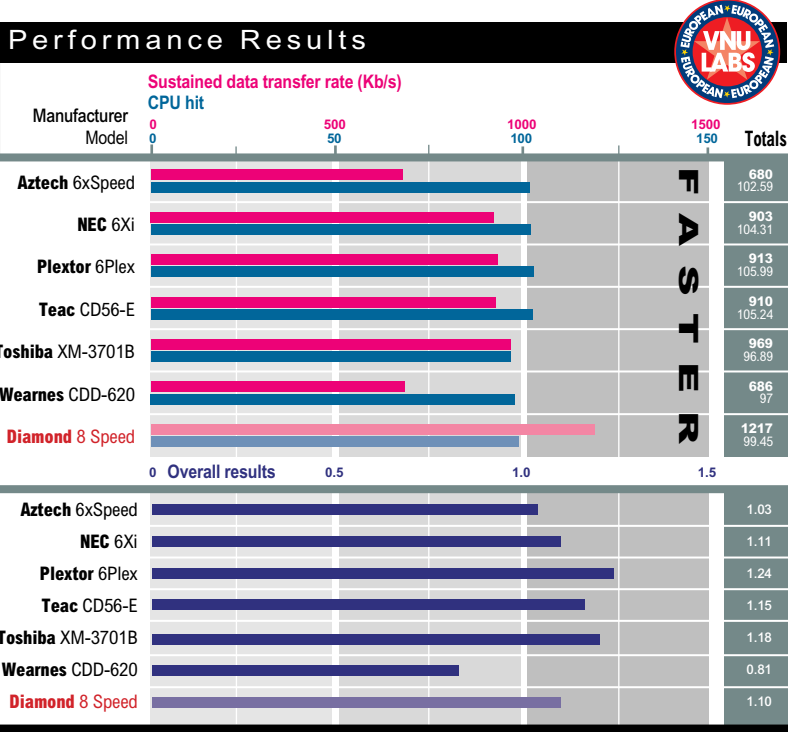
market is in a continual state of flux: one manufacturer drops its prices, and then the others follow; making simultaneous comparison difficult.

All the SCSI drives are generally at least half as expensive again as their E-IDE counterparts. On the other hand, all the SCSI drives delivered more than the expected 900Kb/sec. NEC's quoted street price appears to be a little optimistic, placing it and Plextor at level-pegging. NEC's drive boasts audio transport controls and gains bonus points for front panel design, but Plextor has a superior driver and set of utilities. Both are excellent choices, but for a little extra you should be able to get the Toshiba which had the highest transfer rate, but a larger, undesirable processor hit. The Plextor had a lesser

processor hit, which combined with its second best transfer rate places it as the highest overall performer. Taking its lower price into consideration, the Plextor 6Plex receives our Editor's Choice award for SCSI drives.

Teac's CD-56e represents particularly good value with excellent performance levels (being the only E-IDE to top 900Kb/sec) and a low street price, and thus earns itself Editor's Choice among the E-IDE drives.

The real rock-bottom bargain hunters should look no further than Aztech which currently appears to have the edge on price, even beating several IDE quads. Wearnes couldn't quote a street price at the time of writing, but should be able to come close to Aztech and Teac.



Diamond Multimedia Kit 8000

Yes, it's true. The photo may show a plain-looking internal CD-ROM drive, but the label gives away the exciting truth: that Diamond Multimedia is first on the scene with an eight-speed CD-ROM drive.

Of course everybody else has them in their labs, testing away, but Diamond felt confident enough to send in not a beta version, but an entire retail multimedia pack with sound card and speakers.

The Multimedia Kit 8000 comes with a pair of Yamaha YST-M5 powered active speakers, a 16-bit, 1Mb wavetable sound card, five CD titles consisting of Myst, Magic Carpet, Rebel Assault, Sim City 2000 and Comptons Interactive Encyclopedia 1996, and of course the eight-speed CD-ROM drive.

The sound card has an IDE interface for the CD-ROM drive, and you can also use an existing interface. Yes that's right — the fastest CD-ROM drive did not make its debut on the SCSI bus, but IDE instead.

Most important of all is the performance of the drive, and we are pleased to announce that it scored an impressive 1,217Kb/sec in our sustained data transfer rate tests, making it the fastest drive yet and confirming its eight-speed badge.

On the down side, its performance hit was harder than any of the six-speeds, although not in major way. The drive also runs quite hot so watch your fingers when you remove discs from the tray.

On the plus side is the price, which at around £500 on the street is a bit of a bargain when you consider you get a wavetable sound card and a decent pair of active loudspeakers. Then again, if you can wait a couple of months, everyone else will have their eight-speeds out at nice, low prices, and we'll be featuring the world's first 16-speed — probably.

Price Around £500

Contact CHS Electronics 01483 723411



SIX SPEED CD-ROM DRIVES

Manufacturer	Aztech	NEC	Plextor	Teac	Toshiba	Wearnes
Model	Aztech 6x Speed	NEC 6Xi	Plextor 6PLEX	Teac CD56-E	Toshiba XM-3701B	Wearnes CDD-620
Connection	E-IDE	SCSI-2	SCSI-2	E-IDE	SCSI-2	E-IDE
RRP	£149	£379	£359	£279	£395	£199
Street	£149	£260	£300	£179	£325	n/a
Supplier	Aztech	NEC	Tekdata	Teac	Ideal Hardware	Wearnes
Telephone	01734 814121	0345 300103	01782 577677	01923 225235	0181 286 5000	01727 836330

Super sound boost

Now that WaveTable daughterboards are more readily available, it's easy to upgrade your FM sound board with this simple add-on.

Steven Helstrip explains the advantages and the technology, and puts five boards to the test.

Everybody is producing add-ons these days that allow you to upgrade your existing FM sound board to WaveTable technology — or so it seems. Last time we looked at sound cards (in April 1995), only a few manufacturers had started producing WaveTable daughterboards. In many ways it's like buying an overdrive chip, only different, because you can install one in around three minutes flat, turn on your computer and it works. First time.

Because WaveTable cards use actual recordings of real instruments, you hear

what the composer originally intended: pianos sound like pianos, guitars are convincing, and a trombone sounds as though it belongs to the brass section. With FM, not only do all the instruments sound the same, but you rarely get to hear them all because FM cards are limited to playing 11 voices at any one time.

So if you want high-quality music to complement your games and multimedia titles, WaveTable is the way forward. The good news is that you don't always have to buy a new sound card and it costs as little as £66.

Installing the cards

Any of these cards will connect to 16-bit sound cards that have a daughterboard feature connector. These include most SoundBlaster, MediaVision and Aztech boards. The connector looks similar to the CD-ROM version, only smaller.

To install a daughterboard, just take out your sound card and "sit" the daughterboard in place. Each board comes with three plastic spacers which help to keep a safe distance between the two cards.

Digital effects

With the exception of the Orchid WaveBooster 2, all the cards in this round-up have digital effects. This means reverb, echo and chorus can be added to the instruments to enhance the audio quality.

When reverb is applied, instruments can sound as though they are being played in large concert halls, churches or even your bathroom. The Yamaha DB50XG even allows separate effects to be applied to individual instruments, thus adding further realism.

Chorus effects are numerous and vary from one card to the next. On the whole, though, they "thicken" up the sounds and give the impression that more than one instrument is playing.

In this round-up we have tested, listened to, and made CD recordings of five cards to uncover the best of all. You can hear each card, by using our free CD-ROM cover disc this month, and compare it to the FM equivalent.

How WaveTable works

Before WaveTable technology was implemented in sound cards, the accepted sound standard was FM, or Frequency Modulation. FM produces sound by first creating a sine wave and then mixing it with a second. When the two waveforms

are close in frequency, a more complex waveform is produced, resulting in a new sound. By altering the two patterns, different timbres or instruments can be produced.

However, if you study the waveform produced by a piano, it would be far too complex for an FM generator to reproduce accurately. The same is true for most other instruments and this is why FM cards don't sound realistic.

WaveTable technology works differently. Instead of generating waveforms, it plays back pre-recorded samples of real instruments. A WaveTable chip, therefore, is an electronic table of waveforms.

Due to the size of audio samples, instruments are stored in a ROM chip which in most cases is 2Mb or 4Mb in size. Some professional synthesisers have up to 16Mb for their instrument samples. In addition, whereas one FM sound card will sound much the same as the next, WaveTable ROMs can differ significantly.

Two main factors determine the quality of a WaveTable ROM; the sampling rate at which the instruments were recorded and the number of samples which make up the instruments. Most samples on today's cards are recorded at 44.1kHz, the same frequency at which CDs are recorded. This is why some cards are described as having CD-quality audio. The higher the sample recording rate, the better the sound quality.

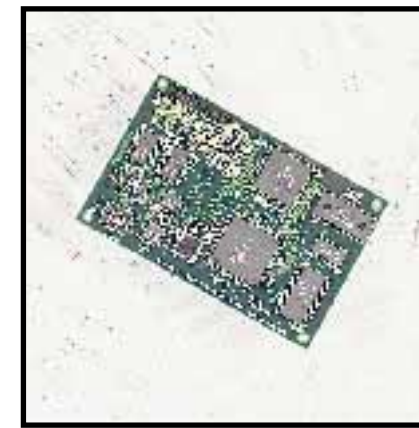
When a real piano is played, different timbres are produced depending on how hard the keys are struck, and where on the keyboard (or pitch) the key was pressed. By taking more samples from the piano, a more realistic sound can be reproduced.

Creative Labs WaveBlaster II

The Creative Labs WaveBlaster II is based on the EMU-8000 synthesiser chip and has 2Mb of samples on board. That's 128 General MIDI-compatible instruments, ten drum kits, and digital effects that include Qsound, reverb and chorus. Qsound creates a 360-degree stereo field, fooling the ear into thinking that the sound is coming from anywhere other than your speakers and comes into effect when playing compatible games.

The same synthesiser chip is used on the AWE-32 sound card and many of the instruments are similar. Consequently, little will be gained by adding this card if you already use an AWE.

In addition to General MIDI (GM), the WBII is compatible with Roland's MT32



synthesiser and is GS (an enhanced version of GM) compatible. Software is provided which allows you to edit the instruments by applying filters and changing settings. Edits can be saved as sysex files (.syx) and further imported into most MIDI sequencers.

Cakewalk Apprentice, a 256 sequencer, is bundled along with a MIDI adaptor kit which enables you to connect any MIDI device. Cakewalk provides score and piano role editing and has an intuitive interface.

Although this card offers better audio performance than FM, the overall standard is disappointing. Many acoustic instruments (pianos, basses and strings) are weak and drum kits are uninspiring.

PCW Details

Creative Labs WaveBlaster II

Price £77.99

Contact Creative Labs 01734 248590

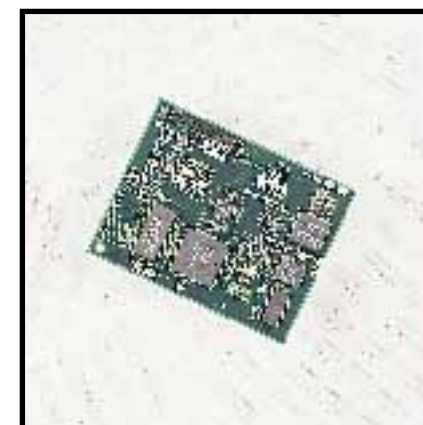
Good Points Great price.

Bad Points Not the best sound.

Conclusion A good bundle.

Orchid WaveBooster 2

This is the cheapest daughterboard in this review and probably the most realistic option for users wanting to upgrade their FM sound card. For your £66 you



get a 16-part, multi-timbral, General MIDI synthesiser, a copy of Cubase Lite, and a Windows control panel which lets you change the card's settings.

The WaveBooster 2 has 2Mb of samples onboard; that's 159 melodic instruments and eight drum kits to play with. As well as providing GM compatibility, it can be used in MT32 mode by selecting an option on its control panel. The card is capable of playing 24 voices simultaneously, more than enough for current games. There are no on-board effects, however.

If you want to dabble with on-board sounds, these can be accessed using a MIDI keyboard along with Cubase Lite (a Windows sequencer). The control panel also lets you play the sounds, enabling you to select instruments and drum kit, and change basic parameters such as modulation.

The sounds on this card don't compete with Roland or Yamaha products but they are a massive improvement on FM. Although realistic, the samples are a little bland and the lack of digital effects leaves them sounding "thin" and dry.

PCW Details

Orchid WaveBooster 2

Price £66

Contact Orchid Europe 01256 479898

Good Points One hundred times better than FM.

Bad Points Samples are a little bland.

Conclusion The one to have if you're on a tight budget.

Orchid WaveBooster 4FX

This is the most expensive of the three cards available from Orchid. The 4FX contains 4Mb of samples — twice that of the WaveBooster 2 — to provide higher-quality instruments and built-in effects. These include six reverbs, two delays and four chorus settings.



The card also offers compatibility with Roland's GS standard, enabling you to accurately modify instrument parameters via a MIDI sequencer. Parameters include the attack, decay and release times of its patches, and the pan position and effects levels of the percussion samples.

There are 128 instruments within the ROMs conforming to the GM specification, and a further 63 timbres which come into play when using GS and MT32 emulation. There are 118 percussion samples as well, laid out across the eight drum kits.

The control panel enables you to select emulation modes and sets up the on-board effects. The sounds on this board are better than those on the WB2, and the effects make a huge difference. But this card doesn't stand up against similarly-priced boards.

Recording Session, a notation-based sequencer, is bundled with the hardware but the package would be a better buy if Cubase Lite were included. Recording Session doesn't provide as much flexibility and is awkward to use.

PCW Details
Orchid WaveBooster 4FX
Price £109
Contact Orchid Europe 01256 479898
Good Points Good sound.
Bad Points Awkward sequencer; not as good as similarly-priced products.
Conclusion Difficult to recommend.



Roland SCD-150

Roland is largely responsible for where music is at, on the PC today. It was the first company to manufacture a "serious" sound card, the LAPC-1, and played an



important role in developing the standards for General MIDI and GS.

The SCD-150 is Roland's most recent card based on its tried and tested Sound Canvas technology. There are 354 instruments crammed into its 4Mb ROM, and digital effects which include eight reverb types and eight choruses.

The card is General MIDI, MT32 and GS standard compatible, making it usable with just about every game, multimedia title and MIDI file around. It offers 16-part, 28-voice polyphony along with ten drum kits that include special effects. The quality of samples is consistently high, and covers the whole spectrum of acoustic and electronic instruments.

DoReMiX is bundled with the package, enabling everyone to create music; you simply drag icons into an Arrange window and the "musicians" play the parts. It has over 600 four-bar music sections which can be chained together — it's easy and fun — and there are 130 MIDI files included, covering many styles of music.

If you want high-quality samples, compatibility and lots of pre-recorded songs, you'll get them all here.



Music software

WaveTable cards don't just make games and multimedia titles sound great — there's heaps of software around that enables you to compose, arrange and print your own music. If you're new to music, then there's software to teach piano, while others require no musical knowledge at all.

Most cards in this round-up come with music software. The best-featured, and easiest to use, is Cubase Lite which is bundled with the Orchid WaveBooster 2.

Lite is a cut-down version of the industry standard music sequencing package, Cubase. It lets you record and edit your performances using several editors, and includes a notation window. To use this effectively, though, you will need some musical knowledge and a MIDI input device, such as a keyboard.

Once the parts have been recorded, they can be copied and moved around via the intuitive Arrange screen. There's also a mixer that lets you set the volume, reverb and chorus levels. Up to 16 tracks can be recorded using as many MIDI channels.

● Cubasis Audio

If you want to record a vocal or other live instrument, Cubasis Audio has additional tracks for doing just that. All you need is a



Visual Arranger enables anyone to make great music. It's easy and great fun



Recording Session enables you to record and edit your music using traditional notation

16-bit sound card and enough hard disk space for your recordings at roughly 5Mb per minute. Audio tracks can be recorded and manipulated in much the same way as MIDI and up to four parts can be played back simultaneously. The audio version includes better editing facilities.

Price £250
Contact Harman Audio 0181 207 5050

● Visual Arranger

Yamaha sent along a copy of Visual Arranger with the DB50XG. No musical knowledge is needed to use this package since all the parts have been recorded for you.

The point is to arrange musical ideas by dragging icons into an Arrange window. Musical styles range from reggae through to jazz and dance. For each style there is a myriad of variations, including introductions, guitar solos, verses and endings.


If you want to get more involved you can play around with the chord progressions, record your own parts, change the tempo and select different musicians to play the parts, or instruments.

This package is lots of fun and is recommended for beginners and children.
Price £39.99
Contact Yamaha Kemble 01908 369269

PCW Details
Roland SCD-150
Price £169
Contact Roland 01792 702701
Good Points Excellent sound, compatibility.
Bad Points Not many.
Conclusion A tad expensive.





Yamaha DB50XG 

When the name Yamaha is mentioned many people think of fast bikes. In fact, Yamaha has been making musical instruments for more than a century now and was the company that developed FM — the technology used in sound cards before WaveTable came along.

The DB50XG is the only card to implement XG technology. In a nutshell, this means that instead of just 128 instruments (like General MIDI) you have a total of 676 sounds, 21 drum kits and

high-quality DSP (Digital Signal Processor) effects thanks to an increased number of variants.

While remaining compatible with General MIDI, the DB50XG has more control over its sound, allowing individual characteristics to be fine-tuned. For example, the EQ of a piano sound — how does this affect the soundtrack from Doom? It doesn't. But games written with XG soundtracks in future will have greater realism.

So is it any good? It's fantastic. The quality of instruments is consistent from the pianos through to the drums and everything in between. Even better are its built-in effects. Because it uses a sophisticated DSP, different effects can be assigned to separate instruments. So instead of merely having reverb on every sound, there can also be a chorus on the guitar, echo on the flute... whatever you want.



Editor's Choice

Are these cards any good? The simple answer is yes. Each card reviewed here proved to be a massive improvement on FM — some more than others. They are easy to install, work as soon as you turn on the computer, and add greater realism to every game and multimedia title.

Choosing which card is best is not easy, but after plenty of listening we decided the Editor's Choice award should go to the Yamaha. The DB50XG has stacks of sounds, fantastic digital effects and a nice price to match. It also comes with a CD-ROM crammed with MIDI files and audio tracks.

Another card worthy of mention is the Orchid WaveBooster 2. It's not particularly the best-sounding card, but if you're on a tight budget, at £66 it's a fantastic buy. You get a copy of Cubase Lite, too, which is the ideal software package to get started with MIDI sequencing.


You can hear how each sound card performs by listening to tracks two to seven on this month's cover-mounted CD.

Do not listen to track 1 as this is the CD-ROM partition which may damage your speakers.



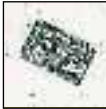


Track listings

Track 2	A typical FM sound card
Track 3	Creative Labs WaveBlaster II
Track 4	Orchid WaveBooster 2
Track 5	Orchid WaveBooster 4FX
Track 6	Roland SCD-15
Track 7	Yamaha DB50 XG

PCW Details
Yamaha DB50XG
Price £129
Contact Yamaha Kemble 01908 369269
Good Points Great sound, amazing price.
Bad Points None.
Conclusion Go out and buy it.



WAVETABLE DAUGHTERBOARDS TABLE OF FEATURES

	Creative Labs	Orchid	Orchid	Roland	Yamaha
Manufacturer	Creative Labs	Orchid	Orchid	Roland	Yamaha
Product	WaveBlaster II	WaveBooster 2	WaveBooster 4FX	SCD-15	DB50XG
Telephone	01734 248590	01256 479898	01256 479898	01792 702701	01908 369269
Price	£77.99	£66	£109	£169	£129
Chipset	EMU8000	Dream	Dream	Sound Canvas	MU50
ROM	2Mb	2Mb	4Mb	4Mb	4Mb
No. Voices	28	24	24	28	32
No. Instruments	128	159	159	354	676
No. Drum Kits	10	8	8	10	21
Reverb	●	○	●	●	●
Chorus	●	○	●	●	●
Bundled Software	Cakewalk Apprentice	Cubase Lite	Sound Impression	DoReMIX	None
					
KEY ● Yes ○ No					

Taking the soft option?

If you want to run PC applications on your Mac you'll have to choose between software and hardware-based emulation. **George Cole** assesses SoftWindows 2.0, the DOS card from Apple, and the OrangePC co-processor.

How do you like your emulation; hard or soft? A growing number of Apple Macintosh users are running PC programs on their machines with the aid of hardware or software-based emulation. The idea of anyone wanting to use PC software may seem puzzling to some Apple enthusiasts, but there are many good reasons why you might want to do so. In many ways, Macintosh owners are in a similar position to those who bought Betamax VCRs rather than VHS machines back in the early eighties. Macintosh users clearly have the better technology (even when compared to PCs running Windows 95), but they are very much in the minority.

Around 85 percent of the world's computers run on Intel processors and Microsoft's MS-DOS or Windows operating systems, compared with around 10 percent for the Apple Macintosh. As a result the first priority for most software companies is the PC. For example, of the 5,500 CD-ROM titles available

worldwide last year, nearly 3,300 were designed for the PC — almost three times the number available for the Macintosh. Apple users often have to wait weeks or even months for the Macintosh version of new software to arrive — and there are far more games for the PC.

Around two years ago, Apple launched a dual-processor machine in the US, which contained both a Motorola and PC processor, allowing users to run Macintosh and PC applications. The machine was nicknamed Houdini, presumably because it offered an escape

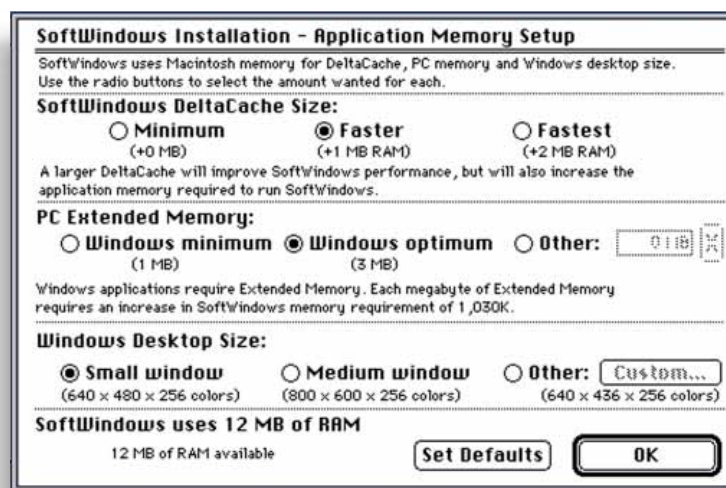
from the horrors of DOS. At the time, Apple resisted calls to launch Houdini in Europe but, last year, it introduced a DOS-compatible card for the Power Macintosh 6100, and the Performa 630 DOS-compatible, which has a Motorola 68040 and 66MHz 486DX2 processor.

The other route for running PC programs on a Macintosh is software emulation — to do this, the British company Insignia Solutions has released SoftWindows 2.0 for the Power Macintosh. Software emulation is cheaper, easier to upgrade and more cost-effective. You do not have to take the top off your computer and the system is more integrated. It sounds impressive, but how well does the software emulation work?

Going soft

Software emulation has an image problem. It's often seen as a slow and rather ungainly method of running "foreign" programs on a computer. But thanks to

faster processors and improvements in emulation design and coding, things are much improved. SoftWindows works on any Power Macintosh, whereas the



SoftWindows' performance can be configured to suit the power of your Mac. Assigning as much memory as you can spare to the program is highly recommended

DOS-compatible card only works with the 6100's non-standard NuBus slot. Another bonus is that SoftWindows can also be networked, which means that you don't have to fit every computer with its own DOS card.

SoftWindows version 1.0 was based on the Windows 286 standard mode, which meant that it only ran around 80 percent of Windows software, and then at a sluggish pace.

SoftWindows 2.0 runs Windows in the 386 enhanced mode and emulates a 486DX processor. Booting Windows in the enhanced mode requires 35 million instructions per second, compared with 5 million for the standard mode. A 486 processor has 1.2 million transistors, whereas a 286 has fewer than 150,000.

SoftWindows translates Intel 486 instructions into PowerPC instructions and uses both static and dynamic compilation. The former compiles frequently-used Intel code into PowerPC code and builds it into SoftWindows. This means that the code doesn't have to be translated or compiled when called into action. Dynamic compilation identifies frequently executed segments of Intel code and compiles them into PowerPC code segments. These are cached and can be run directly when required.

For our test machine, we used a PowerMacintosh 6100, with 16Mb RAM, 500Mb hard drive, and connections to a Pioneer DR-U124X quad-speed CD-ROM drive and 14in Apple monitor.

If you think Windows needs a lot of memory, then you haven't used

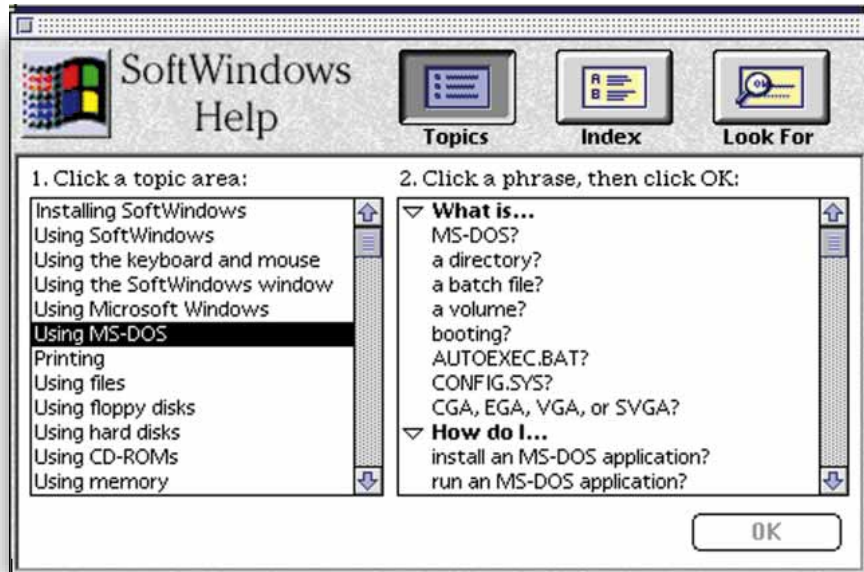
OrangePC

The OrangePC MS-DOS co-processor for PCI or NuBus Macintosh machines comes in a range of configurations; there are three basic models. The 440 model has a PCI interface, up to 64Mb RAM, SVGA graphics and 256K of L2 cache. The 420 also has a PCI interface and up to 32Mb RAM. The 290 is designed for NuBus machines, has up to 32Mb RAM, 128K of L2 cache, a PC Card (PCMCIA) expansion slot and serial and parallel ports.

The cards support 486SX, DX, DX2 and DX4 processors, and the 400 series offers a Pentium OverDrive chip too. An optional 16-bit Sound Blaster-compatible card is available for the 400 series.

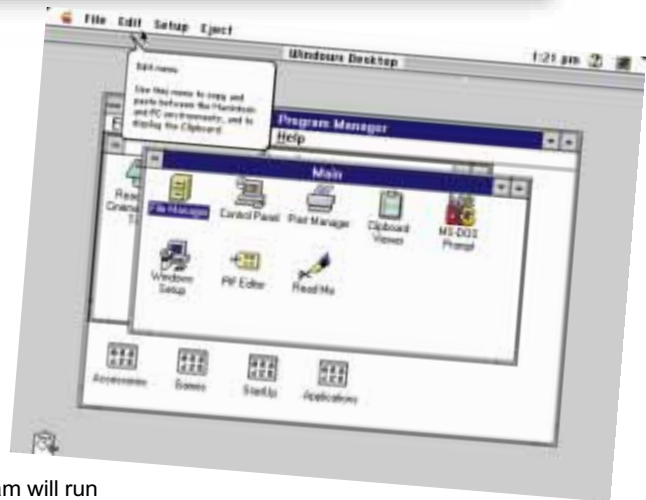
Price Entry level prices start at £854+VAT for a 486DX2 50 with 4Mb RAM

Contact 01706 832662



Above Insignia provides an Apple Guide help file to guide Mac users through the weird and wonderful world of DOS and Windows

Right The Windows 3.1 desktop in all its glory. Everything acts just like the real thing, and you can share data between Mac and PC clipboards. Apple's balloon help also works here



SoftWindows. The program will run on a PowerMac with a minimum of 16Mb, but Insignia recommends a machine with at least 24Mb. This is because SoftWindows requires a minimum of 12Mb, so with 16Mb you effectively have just 4Mb spare for running Windows applications. As Paul Daniels would say: "Not a lot."

SoftWindows comes with MS-DOS 6.22 and Windows 3.1 pre-installed. It offers extensive network support, too, and includes Novell NetWare and LAN manager client software. Ethernet, Token Ring and LocalTalk connections are all catered for. SVGA graphics are supported and audio and video can be played back from either QuickTime for Windows or Video for Windows applications. SoftWindows also cleverly combines the Macintosh and Windows sound systems, and you can even make sound recordings with the Macintosh microphone when using Windows applications with audio features (such as Word and Lotus 1-2-3). AppleScript support is provided for programmers who may wish to write specific instructions for running PC programs. And if you're

running System 7.5, there's an Apple-like balloon help system.

One disappointment, however, is that SoftWindows does not support the DOS sound system. Insignia considered emulating a Sound Blaster card, but the required processing power for the sound alone was equivalent to an entry-level PowerMacintosh! It means playing PC games without their sound effects. However, now that PCI PowerMacs are here, it is likely that some users will install a PC sound card. Insignia is looking at ways of getting sound from these when running DOS programs under SoftWindows.

Special mention should be made of Insignia's instruction book, which is one of the best I've seen. It's clear, concise and packed with useful advice. It's a format that other companies might wish to, er, emulate.

The installation of SoftWindows from CD-ROM is quick and simple. However, the first installation wasn't successful because for some unknown reason, the software decided that my machine only had 10Mb of RAM available for



Power Macintosh 6100 with DOS-compatible card

The PowerMac 6100 typically comes with a 66MHz PowerPC 601 processor, 8Mb RAM and a 350Mb drive. But add a DOS-compatible card and it turns into a different beast. You can buy the 6100 with the card built in, and in this case the machine comes with MS-DOS 6.22 and Windows 3.1 pre-installed. Or you can buy the card separately and install it yourself. The card fits into the 6100's single NuBus slot. The DOS card is well specified: a 66MHz 486DX2 processor, 8Mb RAM (expandable to 32Mb) Sound Blaster 16 card and SVGA graphics. It's not exactly leading-edge PC technology, but it's enough to run most PC programs comfortably.

With the DOS card installed, the 6100 can run native PowerPC software, standard Macintosh 680x0-based programs, and DOS and Windows applications, all of which makes it a very versatile machine. So much so that the 6100 won PCW's 1995 award for the Best PC System (see our June '95 issue). Incidentally, although Apple has now replaced its first-generation PowerMacs, it's keeping the 6100 in its range. Our machine came with the card and software installed, although I soon hit a nasty problem — my PC was dumb. DOS and Windows programs were silent, both through the monitor and the CD-ROM drive's headphone socket. Fortunately, the problem was soon solved. By going into the sound control panel, clicking Options and then selecting Internal CD and Play Through, my PC-in-a-Mac beeped into life.

The PC software and files are stored in a drive "container", which acts as a PC hard drive on the 6100's hard disk. The DOS-compatible software uses up around 25Mb of disk space and Apple suggests setting a minimum of 40Mb for your drive container (if the DOS card is pre-installed, the drive container should already be set-up for you). Windows eats up lots of hard disk space, so if you find your drive

container filling up, you can create a second one.

Operating the 6100 as a PC is very easy. A PC setup control panel, which is selected from the Apple menu, allows you to configure the system to your own particular needs. For instance, you can instruct the 6100 to switch over to PC mode on booting up, or make the screen fade during the changeover from Macintosh to PC or vice-versa. If you want to use a PC CD-ROM, you select a temporary drive from the Sharing panel on the PC control panel.

Switching between PC and Macintosh simply involves hitting a couple of keys (Control, and Return). The screen fades and then magically displays the DOS screen, complete with flashing C: prompt. Type WIN and you're into Windows. The 6100 ran DOS and Windows 3.1 software well. The applications we tested included DOS games, Word for Windows, the children's writing package Creative Writer, and multimedia CD-ROM titles like Microsoft's Dangerous Animals. It also coped with Windows 95 and the Office 95 suite, although its speed is nothing to write home about. Although Microsoft says that existing Windows programs should run at least as well under Windows 95, my subjective impression was that the 6100 was happier with the 3.1 version. Text and graphics can also be transferred between the two environments via DOS, Windows and Macintosh clipboards. However, you can't transfer sounds from PC to Macintosh or vice-versa.

All in all, the 6100 acquitted itself well and while it isn't the raciest PC in the world, the ability to run PC programs on a Macintosh more than makes up for this.

Price £1,874.13 (inc VAT); DOS-compatible card £487.63

Contact Apple 0181 569 1199

SoftWindows. The results of trying to run Windows applications on this were abysmal, with the 6100 taking ages to write each screen and most programs refusing to run and throwing up all sorts of error messages. If this happens to you, my advice is to re-install SoftWindows. When I contacted Insignia about the problem, the company was stumped for an answer as to why this had happened. The second installation was more successful, with 12Mb of RAM being allocated to SoftWindows.

The next step is to decide how all this RAM is to be used. There are three parameters to set: the size of the DeltaCache, the amount of PC Extended Memory and the size of the Windows desktop. The smaller you set these parameters, the less memory you need, but then the slower SoftWindows works. If you've got lots of RAM go for the highest DeltaCache and Memory Management settings you can — SoftWindows tells you how much RAM your settings need and warns you if there isn't enough.

The extra 2Mb of RAM gained on the second installation made a big difference and I could even use PC multimedia CD-ROMs such as film guide Cinemania 95. Arnie's "I'll be back" speech from the film "The Terminator" boomed through my speakers and the Video for Windows movie clips of "2001: A Space Odyssey" and "The Godfather" ran fine.

SoftWindows allows both PC and Macintosh windows to be displayed together on-screen, making it very easy to cut and paste between the two environments. The only caveats are that it works best on a large screen (preferably 16in or more), and some PC applications won't run in anything smaller than full screen, 640 x 480 VGA graphics. But even if you can't display both windows simultaneously, cutting and pasting between PC and Mac is a simple procedure. For example, transferring text from a document in Creative Writer involved copying it into the Windows clipboard, closing down Windows, opening the Macintosh desktop and then running Word. After locating the right file, the text was simply pasted using the Macintosh edit menu.

Standard Windows programs like Word also ran satisfactorily under SoftWindows, although the speed of the 6100 was more that of a fast 386 than a 486 PC. But then, the idea behind SoftWindows is not for people to throw away their PCs and buy a Macintosh, rather it is designed for those who use the latter for most of their work, but may need to use the odd piece of PC software — even if it doesn't fly off the screen.

With only 4Mb of RAM available for Windows, I didn't attempt to operate SoftWindows under Windows 95. Insignia does not recommend SoftWindows users moving over to Windows 95: although

Windows 95 programs may run, the performance is unacceptable, says the company. But Insignia is developing a version of SoftWindows which will be optimised for Windows 95.

Conclusion

Neither hardware nor software emulation will turn a Macintosh into a high-powered PC. If you find you need to run lots of Windows programs, then buy a PC. But if you have only occasional need to use PC applications, then hardware and software-based emulation is a godsend. If you're using a low-end machine like the 6100, then I would go for the DOS card, which will run your Windows programs faster and has the extra bonus of offering sound with DOS programs.

However, if you've got a high-end PowerMac with lots of RAM, or you need to run DOS or Windows programs on a network, then SoftWindows is the route to take. Either way, you'll be delighted with the ability to turn your Mac into a PC. And you'll be even more pleased to know that you can switch your PC back into the Mac with just a couple of keystrokes. ■

PCW Details

SoftWindows 2.0

Price £329

Contact Insignia Solutions
01494 459426



Even within the more complete environment of Windows 95, there's still some room for utility suppliers to step in with upgrades. **Tim Phillips** reviews the first batch.

Utility Vehicle

Windows 95 isn't the bunfight for utilities suppliers that you might imagine. Although it gives them a good opportunity to upgrade their software and sell us new versions of old products, Windows 95 is a much more complete environment than 3.11, and takes care of many housekeeping jobs perfectly adequately.

On the other hand, Windows 95 is neither perfect nor complete. While some utilities, especially File Manager replacements, are all but redundant, things like virus protection, disk maintenance and memory management should not be neglected, and this is where suppliers can step in. This month we review the first batch of Windows 95 products to see what's on offer and whether it's worth upgrading.

● WIN'95 Advisor 1.01

TouchStone has a long track record in diagnostic tools, but often its products have been aimed more at the professional end of the market. This utility is handy for users who don't have Windows 95 yet. If you're thinking of upgrading your software, and want to check whether your hardware is up to the job, then at around £20 this utility might be worth looking at.

The premise is simple: install this software under Windows 3.1 (it needs at least this to work) and it checks your hardware, even doing some multimedia benchmarks. It then comes back with a set of recommendations and compiles a report for you. If you upgrade your hardware, simply rerun the software and it will revise the report, giving you a new score.

The design is good: for software like this you need a coherent interface with a clear message, which minimises the work for you. This supplies the lot. The overall score is represented as a big dial in the middle of the screen, with a rating out of



Left Check your PC's performance under Windows 95 before installing it, with WIN'95 Advisor

Below Running multimedia benchmarks on the components warns of any system bottlenecks. You can re-run them after installing Windows 95 to fine-tune the system

95 and a one-word assessment, ranging from "Wow!" to "Fail". Big buttons and lots of help make this the sort of application that's useful for professionals but unbreakable by idiots.

That said, it's not all sweetness. Advisor was complimentary about a couple of PCs which were truly hopeless. Granted, it refers to having 4Mb of RAM as a "con" but it claims this is enough to run Windows 95, whereas in fact any less than 8Mb is a complete non-starter. The analysis of disk space left me wondering too — I was bemused when it concluded that although I would have minus 47Mb of hard disk left after installing Windows, this was still "enough".

The product is probably best used in a workplace, where it can be installed across a number of PCs prior to upgrading to Windows 95. By systematically testing a number of machines this way, you can handle all your upgrade problems in one pass, eliminating a messy trial-and-error procedure. For this reason too, I don't recommend you buy this with Windows 95, even though it does a good job of preparing your existing software. Buy it a couple of weeks



before you install Windows 95, and use it to make a hardware shopping list.

PCW Details

WIN'95 Advisor 1.01

Price £29.99

Contact TouchStone Europe
01442 862612

Good Points Neat design.

Bad Points Marginal use for a single PC.

Conclusion An inexpensive way to avoid upgrade headaches.

● Norton Utilities

Although the Windows 95 Plus Pack tries to supply a set of disk-based utilities,

don't be fooled. Norton has come up with the real thing. It's the tenth release of Norton Utilities, and although Windows 95 has tried to pull the rug from under it, this is a complete and exhaustive set of disk functions.

Norton worked closely with Microsoft during the development of Windows 95, and it shows. This is the slickest, best organised set of utilities in this review.

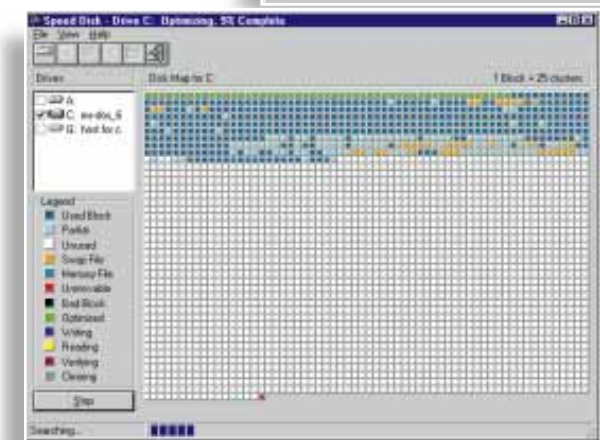
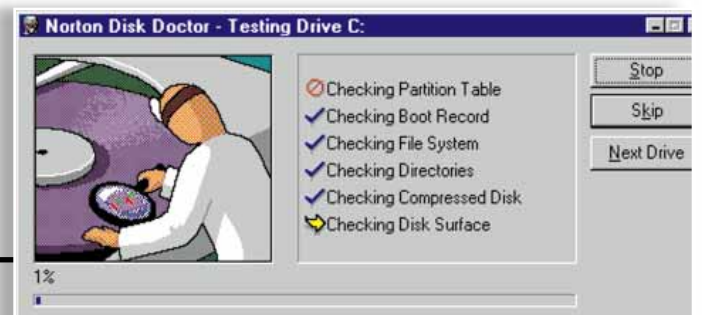
You can start with the Norton Utilities before you upgrade to Windows 95 if you want — there's a pre-installation tune-up under DOS. It's not like the Windows 95 advisor software, also reviewed here — it doesn't attempt to provide a hardware upgrade checklist. What it does do is tackle the most tedious jobs; deleting unwanted files, cleaning up the hard disk and checking for defects. If you are nervous about your PC's ability to upgrade, this is strongly recommended.

Norton Utilities for Windows 95 is missing some of the Norton stalwarts, such as Ncache, DupDisk, FileFind and Control Centre, because Windows 95 duplicates their functions. Instead, Norton has slimmed down the package and tried to add value where it has something to offer that isn't available under Windows.

There's a whole new utility as well: the Norton System Doctor. This is so complete it's quite amusing — it has a graphical display of every conceivable resource running under Windows 95, with up to 80 different monitoring functions. Some are displayed as dials, others as traffic lights, but this system doctor is easy to use and clear to read — something no-one else has managed under Windows 95. You add and remove sensors by dragging them.

Other utilities are given a new lease of life, notably the Speed Disk defragmenter which not only defragments your disk, but does it "intelligently" — files are placed in positions where they are less likely to

Right Norton Disk Doctor, still going strong, and with an animated sequence to make it interesting. Here comes the man in the white coat



Left Running Speed Disk can be done quite safely in background, but you miss the colours in the display. The graphics represent individual blocks of data on the disk

fragment in future. The position of the swap file is also optimised, a much-neglected speed-up for Windows users, and the whole operation runs perfectly happily in the background, although obviously it does slow disk access.

Symantec is quite pleased with itself, having designed all its utilities as true 32-bit applications so that they run on their own protected virtual machine. It claims this as an advantage over Microsoft, which makes sense: if you're going to mess about with low-level file operations, you ought to do it properly.

With animated displays, easy-to-use menu structures and a level of information that inspires confidence, this is an impressive set of disaster recovery and optimisation utilities.

PCW Details

Norton Utilities

Price £129

Contact Symantec 01628 592222

Good Points Excellent utilities.

Bad Points None.

Conclusion The original and the best.

● Norton Anti-Virus

The Norton Anti-Virus package functionally appears similar to the 16-bit Windows version. But that's where the similarity ends.

Because virus products work at a low level, existing Windows 3.x virus protection doesn't work under Windows 95, so Norton Anti-Virus has been completely rewritten and retooled. It's hard to say which virus product is the best at finding

viruses: even the developers admit that, from one month to another, a different package is rated "best". However, with free monthly updates to its virus list and the resources to keep up the depressing work of catching and curing viruses, Norton is a strong contender. You can download the monthly updates from the Symantec bulletin board, from CompuServe or even its web site, free of charge.

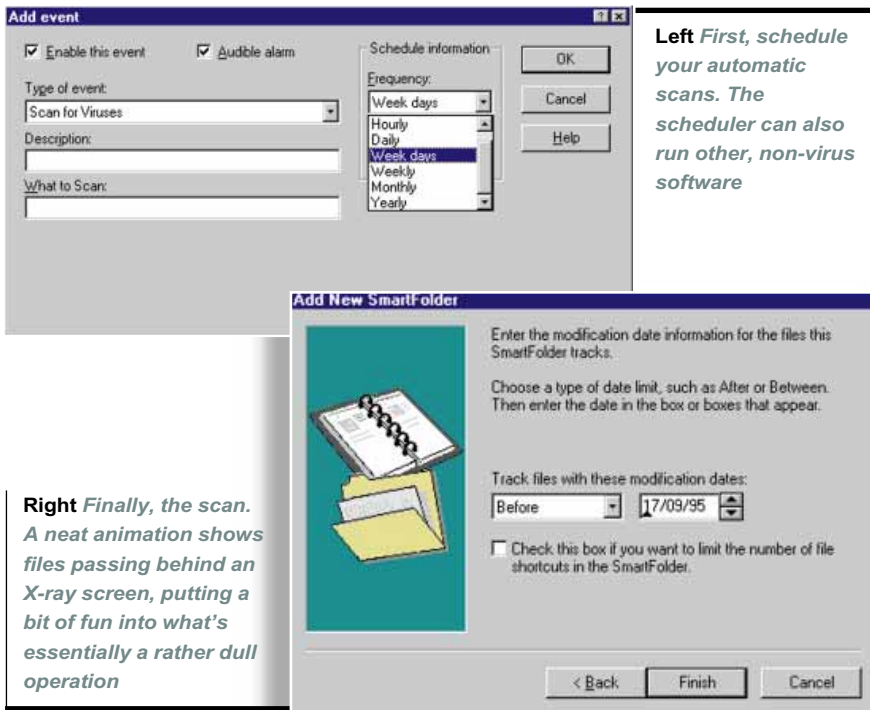
Once installed, the product is 6Mb, which is fat for a virus checker. As Windows 95 doesn't carry any built-in virus checking, I would suggest that if you ever use risky floppies, this could be invaluable.

Norton's customary easy interface is well suited to the limited range of activities that a virus checker does. Four big, fat buttons control the configuration and the manual virus checking options. The only tiring part is configuring the system's automatic operations. Symantec is nothing if not exhaustive with its range of options, including a very useful option to partially check files in certain directories or of certain types. This comes in handy when you forget to empty the Recycle Bin after deleting files on the desktop — the files are stored in a directory called \recycled, which doesn't show up in the file tree but can quickly become huge.

Another useful feature is the "proactive" virus checking that Norton provides. This monitors changes to critical files and sections of your disks, the sort of changes that a virus would make. While the method of providing fixes for each category of viruses is the safest — hence the list of viruses that you get with every anti-virus product — this is a way to detect most new types of infection.

Symantec's viruses make interesting reading. You can get clued up on each individual virus, including what it does, how it works and how common it is. It may be some consolation to become an instant virus expert.

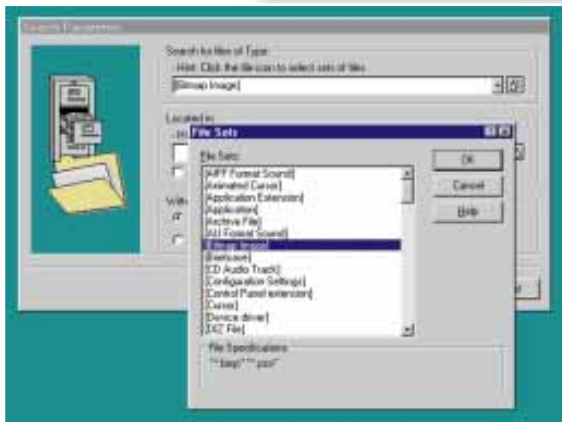
As well as allowing you to automatically schedule your virus checking operations, the scheduler is flexible enough to schedule other software to run automatically as well.



Left First, schedule your automatic scans. The scheduler can also run other, non-virus software

Right Finally, the scan.

A neat animation shows files passing behind an X-ray screen, putting a bit of fun into what's essentially a rather dull operation



Left Zipping files using the Wizard is a quick way to build archives and preserve disk space

the standard configuration of menu tree on the left, file list on the right. It's more flexible, because there are tabs in the bottom corner which allow you to view the menu tree in a variety of

ways, but I'd question whether this is really a bonus, as the default view gives all the information you need. It does list deleted files from each directory, though — very useful if you want to recover them.

One quibble with the desktop, which represents ftp sites on the internet as folders — a useful idea — is that it did not show the desktop folders in their appropriate position outside the directory tree, placing them instead in their "logical" position as subdirectories of Windows.

Along the top of the File Manager a set of buttons perform some of the other functions. The file searcher is ten times faster than a Windows search, Symantec claims, and a series of searches that I made backed this up. There's a neat fast zip utility which complements the more extensive standalone version included in this package, and one useful director function which allows you to synchronise

● Norton Navigator

One of the undeniable facts of life is that as Windows improves, even if it does so slowly and imperfectly, there are some utilities it positively eats up. This is perhaps one of them.

Navigator is an extension of the Norton Desktop under Windows 95, and although it is an excellent product, I would only recommend it to the very keen. That's not to say it is poor; just that whereas Norton Desktop was a lot easier to use than the Windows File Manager, this is only a bit easier.

The Navigator is more than its name suggests. It's a collection of file-related utilities that expand the Windows 95 desktop and make it easier to use.

The most obvious incarnation is Navigator's File Manager, which, as the name suggests, is like the Windows Explorer on steroids. It's a neat-looking interface, with

PCW Details

Norton Anti-Virus

Price £79

Contact Symantec 01628 592222

Good Points Full 32-bit code, flexible.

Bad Points Could be confusing for beginners.

Conclusion An essential item, and one utility you can't just fudge with a 16-bit version.

two folders.

For power users, the ability to use a variety of customised desktops, which are represented as icons on the task bar, will be extremely useful. It means that you can keep a different set of desktop applications for different tasks without cluttering the single Windows desktop, and this will undoubtedly be a huge boon to 640x480 notebook users.

With the ability to enable long filenames — although crucially not for some Microsoft 16-bit applications — the Navigator is a useful bunch of utilities. There's not a killer among them, though.

PCW Details

Norton Navigator

Price £99

Contact Symantec 01628 592222

Good Points Desktops can be customised, fast searches.

Bad Points That's more or less it.

Conclusion Nicely done, but not a dramatic improvement over Win95.

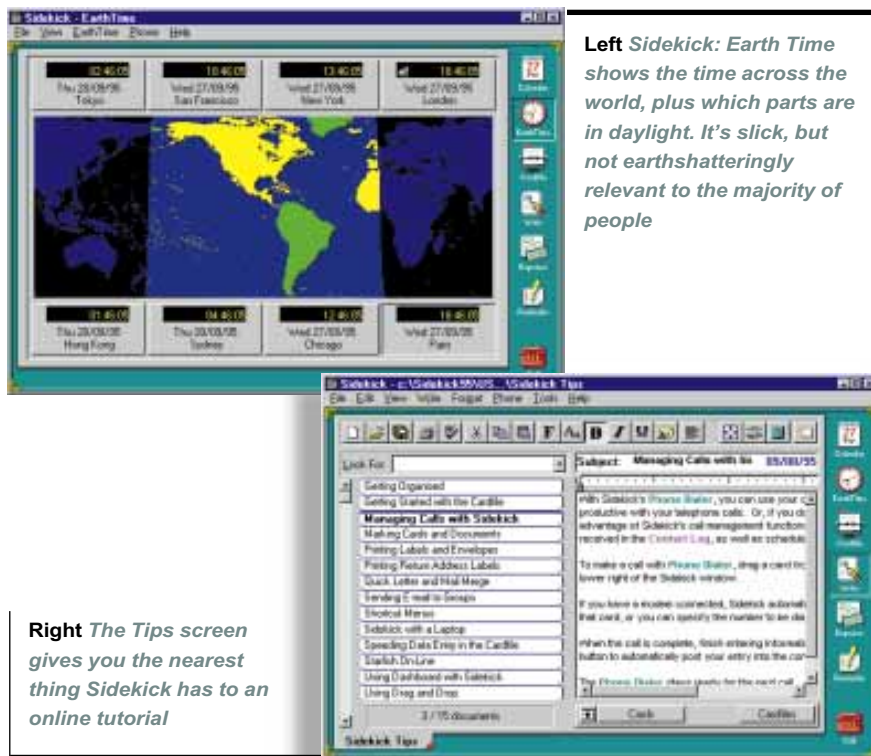
● Sidekick

The original contact manager comes blasting back under Windows 95 with a good-looking interface and — even if it's not the easiest product in the world to use — a breadth of features that will satisfy most users.

Sidekick was late to the Windows environment, but it has compensated by learning from other earlier entrants. Specifically it combines the contact management power of ACT! with some of the ease of use of Lotus Organiser (Lotus still sets the standard for ease of use). Sidekick has a much grander design though — it isn't a calendar, a scheduler, a contact manager, a jotter, an address book or a database. It's all of these, plus some.

The heart of Sidekick 95 has to be the reminder page. On this one sheet you can see all your appointments, calls and things to do — from this point you can start to access all your other features. The other views look similar, so it can be disorientating to use at first, but they are fast and intuitive, and with a number of buttons which allow you to switch between views, Sidekick under Windows is as quick to use as ever.

During the eighties, many DOS users took advantage of Sidekick for all their office functions, for example using the text editor to prepare letters. Although the text editor is hardly state-of-the-art for users familiar with Microsoft Office, it is



Left Sidekick: Earth Time shows the time across the world, plus which parts are in daylight. It's slick, but not earthshatteringly relevant to the majority of people

Right The Tips screen gives you the nearest thing Sidekick has to an online tutorial



Dashboard 95 offers a positive horde of features and functions, but is unlikely to have the same impact under Win95 as it had under Win3.1

● Dashboard 95

The old Windows desktop was ripe for improvement, and Dashboard was one of the best utilities for enhancing ease of use. This version still improves on the Windows 95 desktop, but is best suited to power users, as it's a big, complex utility which can be quite tricky to learn.

Dashboard, as the name suggests, is a central resource from which to launch applications, monitor system use and find documents. With all its parts enabled, it takes up quite a portion of an 800x600 screen, although you can snap off utilities you don't require.

When you install the one-disk utility, it automatically makes a first pass at organising your desktop, grouping the applications that it recognises into functional groups. These include suites, like Microsoft Office, email applications and games. These groups can be edited without any problems, but mine were quite

neat and almost complete, the icons in each tabbed folder displayed in turn on the dashboard toolbar.

At the top of the toolbar, the program groups are listed — using both seemed to be overdoing it a bit, so I snapped the top layer off, which cut down on the amount of space used and made the rather busy Dashboard interface easier to follow.

System resource usage is a handy utility which might reasonably be expected on the Windows taskbar, but Dashboard comes to the rescue with a neat display of CPU utilisation, memory use and the number of current threads running. This is power user stuff, although low-end Windows 95 users might find it useful — with the resources needed by some Office applications, readouts provide an invaluable warning that they aren't going to be able to open those graphics files after all.

All in all, Dashboard is flexible and easy to configure. It is hard to read though, and for most users, using this on top of Windows 95 will create more problems than it solves. It is helpful, but the Windows 95 desktop itself strikes a good balance between ease of use and flexibility. Unless you either need the system use resources or are an upgrading Dashboard user, this is in danger of failing the "so what?" test.

PCW Details

Dashboard 95

Price £39

Contact Starfish Software
0181 875 4455

Good Points Powerful.

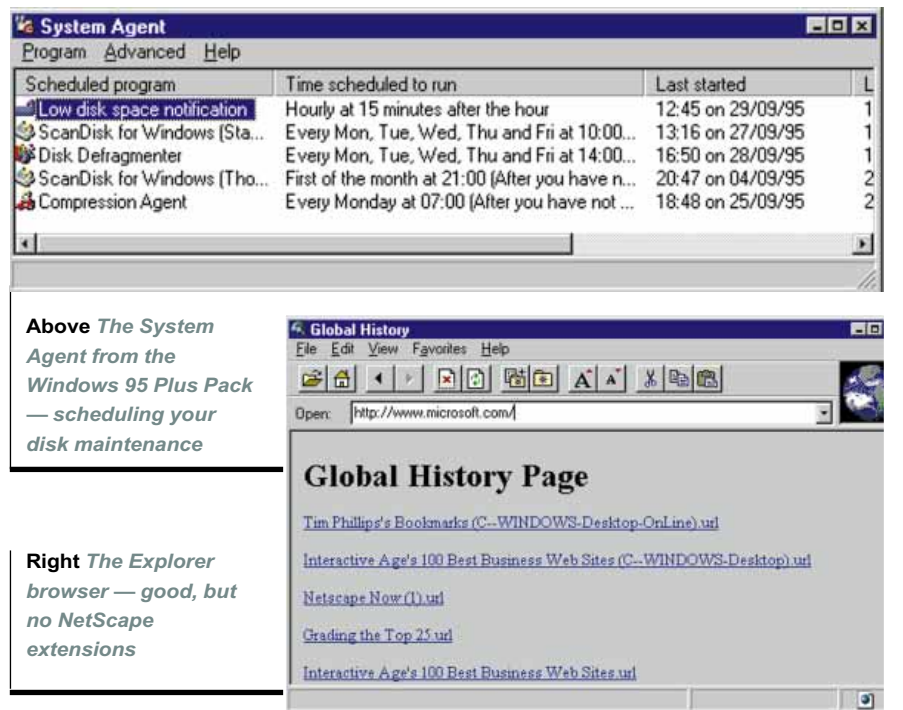
Bad Points Can cause more problems than it solves.

Conclusion Stick with the standard interface.

● Windows 95 Plus Pack

If you want to pay that little bit more for your Windows 95, Microsoft will sell you the Plus Pack. For many users it's just what it says — a plus, but it certainly isn't a panacea for all utility problems. One drawback is that the Plus Pack has no central theme — it's the bits that didn't make it into the main part of Windows 95.

First there are some Norton-like Disk optimisation tools. One which will be useful to users of older PCs is the disk compression utility, a piece of software which you either love or hate. Disk compression is not immediately attractive with the fall in price of hard disks, but if you have a 200Mb or smaller hard disk and you don't want to do a hardware upgrade, then DriveSpace 3 is a must. We successfully



Above The System Agent from the Windows 95 Plus Pack — scheduling your disk maintenance

Right The Explorer browser — good, but no NetScape extensions

compressed a 250Mb hard disk, which took a couple of hours and had a slightly adverse effect on performance, especially with high I/O applications such as video.

Oddly, the Plus Pack does not use 32-bit disk-diagnosis and file-fixing utilities, but it will recompress, check and repair your disk at prescheduled times using a utility called the System Agent, which Norton Utilities does not provide. This is an excellent idea, allowing you to schedule your disk maintenance for night time. It will also recompress your hard disk at night too, speeding up daytime usage.

Disk utilities are not the only extras — there's Microsoft's Internet Jumpstart kit. The TCP/IP stack you need to connect to the internet is part of Windows 95, but this adds two features: a web browser called Explorer, licensed from Spyglass; and an internet mail reader. Explorer installs seamlessly on to the desktop, but it is not as intuitive as the NetScape browser, which you can download free and which is a better idea, especially as many sites are using NetScape's HTML enhancements.

The final part of the Plus Pack is called the desktop themes module, which allows you to customise your desktop to a theme. The most bizarre is the 1960s America theme, which provides suitably hippyish sounds and spinning CND symbols. Dangerous Creatures is in there too, but most users we consulted found the Themes too intrusive, and tended to take them off the desktop after a few days.

PCW Details

Windows 95 Plus Pack

Price £30-£40

Contact Microsoft 01734 270001

Good Points A nice set of tools.

Bad Points No utilities really stand out.

Conclusion Should have been standard in Windows 95.

● WINProbe 4.0

WINProbe is another system performance and evaluation tool, and if you are clued-up enough on the technical side to understand what it's telling you, it does a good job of reporting on your system and telling you how to improve performance.

WINProbe has been around for a long time, and is targeted more at the support professional than the home user. So although it's ideal if you are running a small network, the casual user might find that WIN'95 Adviser or Norton Utilities are easier to understand.

The basic screen in WINProbe is a catch-all diagnostic and reporting panel, which on first view is so packed with data that it is hard to understand. The data is divided into four columns: a hardware report; Windows evaluation; analysis of your critical resources like your GDI heap; and a system monitoring panel. This last panel is the most important, and if you click on a thumbtack in the top right of the screen this stays on top of any



Left WINProbe is a powerful product for fine-tuning your PC's performance, but is not recommended for the casual user

Below The statistics will tell you how your system is performing. The important figure — the compression ratio — improves the longer you use the system

Windows you use subsequently. It's too big to be convenient, so it's best used as a way to see how launching a new application affects system resources.

Along the bottom of the screen are buttons that match every one of the options on the six diagnostic menus. They're very similar, so thankfully WinProbe tells you what each one is. This is optional — many users will turn it off.

The hardware and software diagnostics are uncannily accurate, and will pick up on most hardware faults with few difficulties. This will be secondary for most of us, because we'll dive straight to the Tune-Up menu to try and optimise our settings.

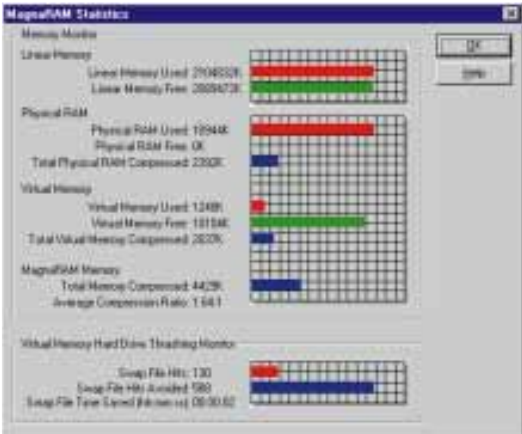
Tune-Up is a disappointment — it doesn't do the job automatically but instead makes suggestions based on your current configuration. It works like a grammar-checker in a word processor, offering you suggestions based on what it has found. It makes optimising Windows a tedious process however, and a little more active help in changing settings would have been handy.

This is a value-conscious bundle: WINProbe works under Windows 3 as well as Windows 95, and Quarterdeck has thrown in a CD-based CD-ROM drive troubleshooter, a 16-bit version of its uninstaller (called Cleansweep) and a copy of web browser Mosaic for good measure.

PCW Details

WINProbe 4.0
Price £49.95
Contact Quarterdeck UK 01245 491190

Good Points A powerful product if you regularly support PCs.
Bad Points Not really for the casual user.
Conclusion Good value.



● **MagnaRAM2**

If RAM is your problem when upgrading to Windows 95, MagnaRAM is one answer. It claims to simulate up to three times the level of memory that you have in your system, and in our evaluation there was certainly a marked increase in system performance.

A disk compression utility like Stacker effectively doubles your hard disk size by compressing data so that more of it fits on the same piece of real estate; and memory compression operates in a similar manner — but it is more complex. Windows is constantly swapping data on and off the hard disk, where it has what is known as a “swap file”. This enables you to open several applications, but slows the system down — a hard disk is several times slower than memory. MagnaRAM gets round this by making a “RAM buffer” into which the data is swapped, and compressing this data in the buffer. So Windows accesses the hard disk less often.

When you install MagnaRAM on your Windows system — again, this Quarterdeck product installs under either Windows 3 or 95 — you don't find an immediate difference in performance. This doesn't mean that MagnaRAM isn't working, it is just that it is only effective when system resources are being used to

their greatest extent. At these times, not having to keep swapping memory out to disk is a huge asset — especially if your system is already using disk compression, which slows down the operation of the Windows swap file.

It's impossible to say exactly how much benefit you get from MagnaRAM — its compression depends on the files you have loaded, and the amount of physical RAM that you have. But a useful rule of thumb, based on the machines we tested, is that you will simulate the memory of a machine with twice as much RAM.

There are utilities to reconfigure MagnaRAM, and to evaluate its performance, but most users will be happy to let it run in background. It's not a great idea to buy less memory and MagnaRAM instead of a fully-configured system, but if since upgrading to Windows 95 you have found your system grinding to a halt under the effect of memory-hungry monsters like Microsoft Office, this offers a cheap way to get out of jail.

PCW Details

MagnaRAM2
Price £39.95
Contact Quarterdeck UK 01245 491190

Good Points Installs easily, and it works.
Bad Points No substitute for real RAM.
Conclusion A cheap way to boost performance.

Editor's Choice

Whether you want to upgrade to new versions of popular utilities depends on how demanding you are — and on what you feel comfortable with. Utilities fans are notoriously protective of their environment, and are much more productive when using these add-ons than when forced to cope with a vanilla system. It's a question of familiarity as much as good design, and with the comparatively low prices of these utilities, there's a lot to be said for upgrading. For the rest of us, it's worth taking time to look at the breadth of features that Windows 95 already provides, and at the utilities like NetScape that you can get for free — you might find they offer more than you think.

The standout package here was definitely Norton Utilities, a rewritten set of applications that are both powerful and usable. Symantec took the brave step of ditching the utilities which were duplicated in Windows, and concentrated instead on adding value. The result is an excellent package which gets Editor's Choice.

Dialog with Delphi

Last month's tutorial created the engine of a great Windows utility, but with little in the way of a user interface. Delphi makes it easy to add standard Windows features like menus and dialogs with check-boxes and spin buttons. This month we use these tools to spice up the *PCW* space monitor, adding a fine degree of user control.

By Tim Anderson.

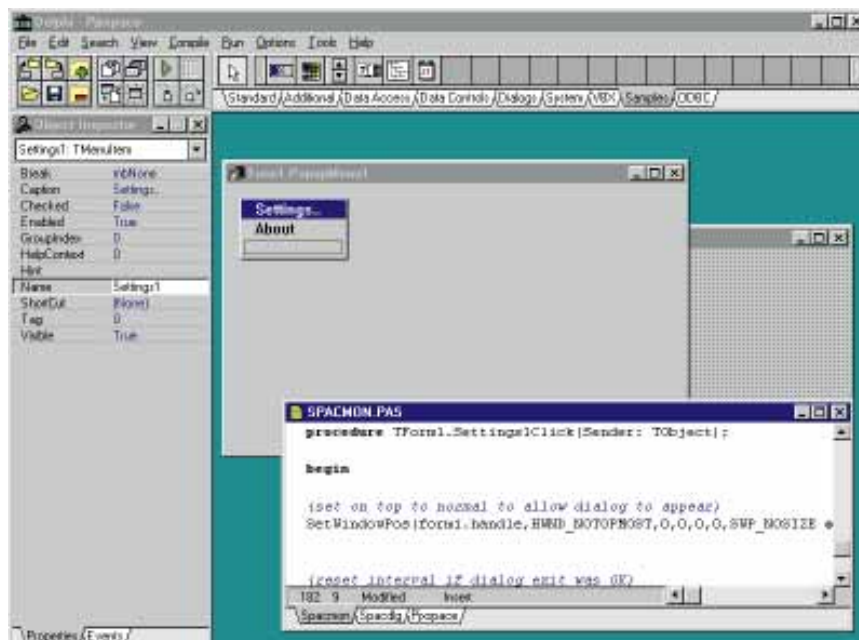
Delphi and menus

Delphi supports two kinds of menus, the traditional menu bar and a handy pop-up type that appears when you right-click the mouse. Both are easy to program. Start a new Delphi project and place a MainMenu component on the form. This component supports no events and just four properties. Think of it as a container for the menu itself. If you double-click the menu property in the object inspector, the menu designer opens.

The menu designer is excellent — intuitive and flexible. As you build the menu, simply click where the next item should appear and Delphi creates it. Then you can set the caption and other properties. An ampersand before a letter in the caption sets a keyboard shortcut and causes that letter to be underlined in the menu.

Attaching code to menu items is just as easy. Each item supports an onclick event. Double-click this event on the object inspector, and the event procedure opens up for you to type in code.

You can add or delete menu items at runtime, either by setting the Visible



property (see panel) or by calling the Add method. For example, this adds a menu item to the bottom of the File menu:

```
var  
mnuNew: TMenuItem;
```

Delphi's menu designer opens the correct event procedure when you double-click a menu item

```
begin
mnuNew := TMenuItem.Create(Self);
mnuNew.Caption := 'My new menu';
mnuNew.Name := 'NewItem';
File1.Add(mnuNew);
end;
```

If you need to create a nested menu item, call the Add method for an item already in a dropdown list. Or to create a new top-level menu, call the Add method for the Items property of a TMainMenu object:

```
mainmenu1.Items.Add(mnuNew)
```

Finally, to associate a procedure with the new menu, set its OnClick property to the procedure's name.

Improving the space monitor

Not all applications need menu bars. The PCW space monitor needs to be small, as it is designed to run alongside other programs. It's an ideal candidate for a pop-up menu. This will give control over some settings, for example to toggle the "always on top" characteristic. It gives an opportunity to explore how dialogs work in Delphi.

Open the space monitor project and place a pop-up menu on the form. Double-click the Items property and add two entries, with captions "Settings.." and "About". Now click the form, and set its PopUpMenu property to "popupmenu1". Run the application. If you right-click anywhere on the form, the menu appears. Neat.

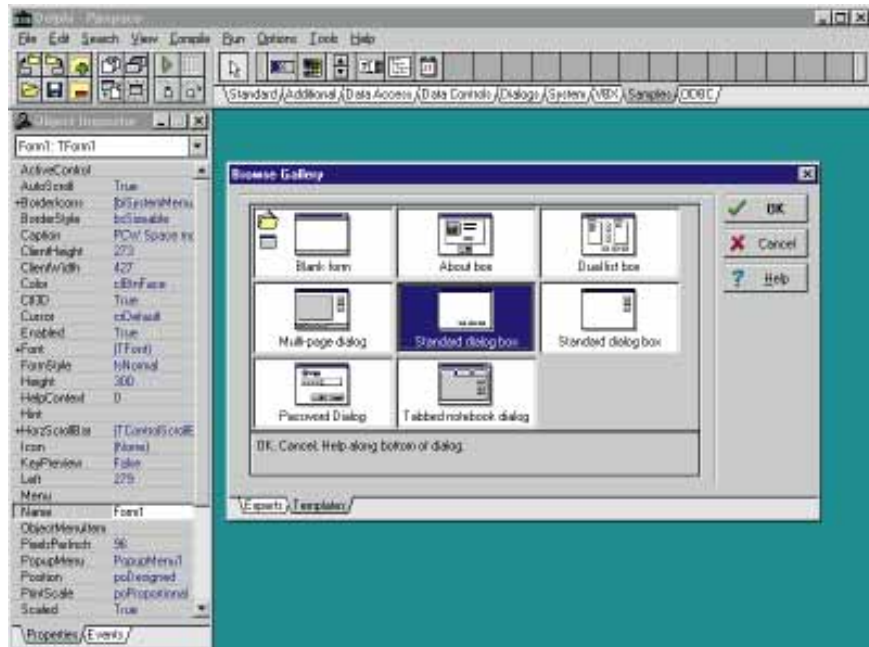
To show that the menu works, you can implement the About item straight away. Open the menu designer again, and double-click the OnClick event for About. In the procedure editor, type:

```
MessageDlg('Your helpful message goes here', mtInformation, [mbOk], 0);
```

The Settings item is a little more involved. First it's back to the form designer to create a dialog.

Creating a dialog box

In Delphi, there is no hard distinction between dialogs and other forms. But there are customisable templates that shorten the work of form design. In this case, choose File - New Form, and select one of the standard dialogs for your template. Delphi adds a new unit and associated form to the project, with pre-set buttons and properties appropriate for dialogs. For example, the position property is poScreenCentre, ensuring that the dialog is drawn in the centre of the screen; and the border property is set to



bsDialog. The Help button is not needed, so select it and press Delete. Then build up the dialog.

The example shown uses two labels, a SpinEdit control (from the samples tab) and a check box. Incidentally, the SpinEdit control is a great example of code re-use in Delphi. It combines two buttons and an edit control, together with some common-sense properties like MinValue and MaxValue. Written in Delphi, the component is now available to all through the component library.

There are two elements the user can adjust. One is the "always on top" setting.

When you choose New Form, this template gallery appears. For the space monitor project, choose one of the standard dialog-box templates

The other is the interval at which the space monitor refreshes its information. By setting the MinValue, MaxValue and Increment properties of the SpinEdit control, the adjustment is kept between 0.25 seconds to 10 seconds, in quarter-second increments. First, set the Name property of the dialog form to Settings-

Menu designer tips

- You can set the visible property of a menu item to false, so that it will not appear when the application runs. Your code can control when to show the item.
- Click the right mouse button in the menu designer to pop up a number of useful options, such as inserting menus from menu templates or resource files.
- Create nested menus by clicking on a menu item and pressing CTRL->.
- A nice touch is to create hints that appear in a status bar as the user traverses the menu.

There are four steps involved:

1. Enter a help message in the hint property for a menu item.
2. Place a panel on the form, with the Align property set to alBottom.
3. Write a procedure called ShowHint, like this:

```
Procedure TForm1.ShowHint(Sender: TObject);
begin
panel1.Caption := Application.hint;
end;
```

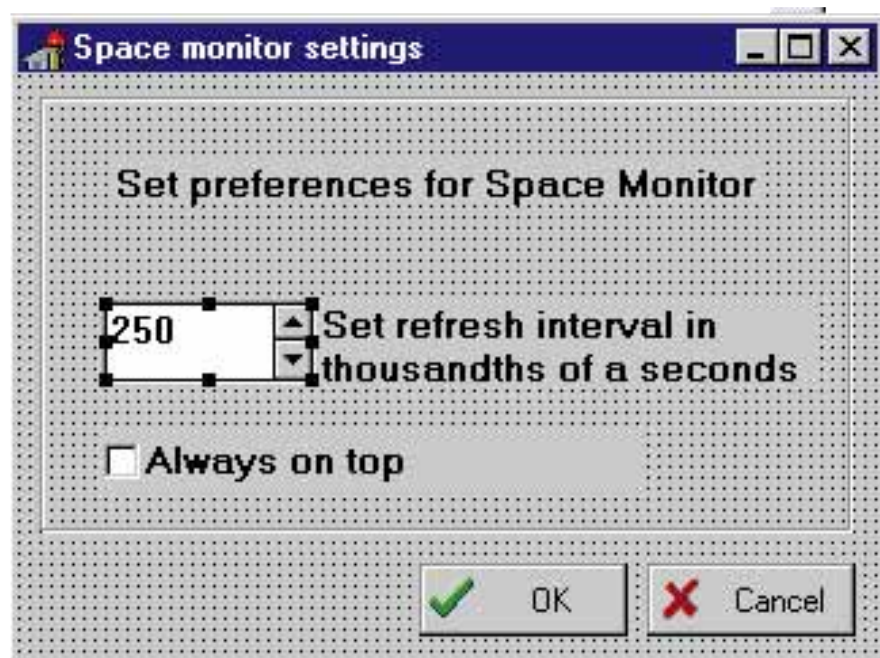
It should be declared in the Public section of the TForm1 class definition.

4. Double-click the form to open the FormCreate procedure, and add the line:

```
Application.OnHint := ShowHint;
```

Now run the application. When you run the mouse down the menu, the hint appears in the panel.





At design time, this is how the settings dialog appears

Dlg. Then save the project and call the new dialog unit SPACDLG.PAS.

Connecting the dialog

The dialog is no use until it is connected to the main part of the application. Here's a possible approach:

1. Add SPACDLG.PAS to the Uses clause of SPACMON.PAS (the unit for the main form).
2. Open SPACDLG.PAS and find the var clause in the interface section at the top. Add two declarations so it looks like this:

```
var
  SettingsDlg: TSettingsDlg;
  Interval: Word;
  OnTop: bool;
```

These variables will contain the user's selections.

3. The OnTop and Interval variables must be initialised when the application first runs. The following goes in the Form-Create procedure for Form1:

```
spacdlg.OnTop := True;
spacdlg.Interval := Timer1.Interval;
```

4. When the dialog opens, the controls should contain the current values. To do this, place the following in the dialog's Activate event:

```
CheckBox1.Checked := OnTop;
SpinEdit1.Text := inttostr(interval);
```

5. As the user closes the dialog, the values are read from the dialog into the

unit's public variables. Open the dialog form and double-click the OK button.

Enter the following:

```
OnTop := CheckBox1.Checked;
Interval := StrToInt(SpinEdit1.Text);
```

Naturally, if the user clicks Cancel, the values do not change.

Tip: If you run this code, you will find the compiler stops on the second line with the Error3: Unknown identifier. Strange, you think, since StrToInt is in the helpfile. But the entry for StrToInt says Unit: SysUtils — and SysUtils is not included by default in the dialog unit. The solution is manually to add SysUtils to the Uses clause.

6. Finally, open the menu designer and double-click the Settings item. Enter the code in Fig 1 (below).

Why all the calls to SetWindowPos? One of the snags with always-on-top

windows is that they easily get in the way. In this case, the ShowModal method opens the new dialog. But if the main form is always on top, the dialog will open underneath it. The workaround is to remove the on-top setting before opening the dialog, and put it back afterwards. You may have noticed the same problem with the About box, and you can use the same technique to fix it.

It's important that dialogs can be closed with Cancel, to ignore any changes. Delphi makes this easy to implement. The ShowModal method returns a value called ModalResult, which can be one of several constants. This is one of the properties of a Delphi command button. In this case, the buttons on the dialog form have ModalResult properties set to mrOK and mrCancel respectively. You don't need to write code to close the dialog: these buttons work automatically once the ModalResult has been set.

That's it! With the space monitor developed into a handy utility, next month it's time to look at database development.

Delphi quirks and quibbles

One thing that may puzzle you is why we used the API call SetWindowPos as opposed to the much simpler FormStyle property, which can have a value of fsStayOnTop. In fact that was tried; but changing the FormStyle property causes the whole form to be refreshed, creating an ugly flashing effect. The obvious solution to a problem is not always the best.

Another issue is about form creation. When you add a form to a Delphi project, a line gets inserted into the project source. For example:

```
Application.CreateForm(TSettingsDlg,
  SettingsDlg);
```

Fig 1 Code for connecting the dialog

```
{remove on top setting to allow dialog to appear}
SetWindowPos(form1.handle,HWND_NOTOPMOST,0,0,0,0,SWP_NOSIZE or SWP_NOMOVE);

{reset interval if dialog exit was OK}
if Settingsdlg.showmodal = mrOK then
  timer1.interval := spacdlg.interval;

{must restore on top status anyway}
if spacdlg.OnTop = True then
  SetWindowPos(form1.handle,HWND_TOPMOST,0,0,0,0,SWP_NOSIZE or SWP_NOMOVE)
else
  SetWindowPos(form1.handle,HWND_NOTOPMOST,0,0,0,0,SWP_NOSIZE or
  SWP_NOMOVE);
```

Recommended reading: Delphi Starter Kit

Authors: Jeff Duntemann, Jim Mischel and Don Taylor
Publisher: Coriolis Group Books
Pages: 656 with CD
Price: £38.99 inc VAT
Contact: IDG 0181 579 2652

When is a book not a book? The Delphi Starter Kit is a typical book/CD package but unusually comes in a box, enabling the publishers to call it a kit instead. The book itself is called Dephi Programming Explorer, and that is what you really pay for. The CD is mostly a showcase for Delphi add-ons and magazines, with invitations to register or subscribe. Articles are in the dreaded Acrobat format. There is also sample code from the book.

If you are sensitive to English style, you may not like this book. The authors promise “a wild good time” and the first chap-

ter is called “Way RAD!”. Part 3 is called Ace Breakpoint’s Database Adventure including lots of human interest. Then again, writing about programming in a lively manner is not easy, and credit to Coriolis for trying a new approach.

The real content is rather well balanced. There’s an introduction to the Delphi interface, an explanation of Pascal programming basics, and strenuous efforts to expound the elements of Delphi’s object model in a way that anyone can understand. The database material is skimpy, except that the “database adventure” does explain how to put together a database application. The other main example is an object-orientated mortgage application. While not as thorough as some others, the Delphi Starter Kit doesn’t duck any issues and provides a good grounding, so long as you can cope with the writing style.

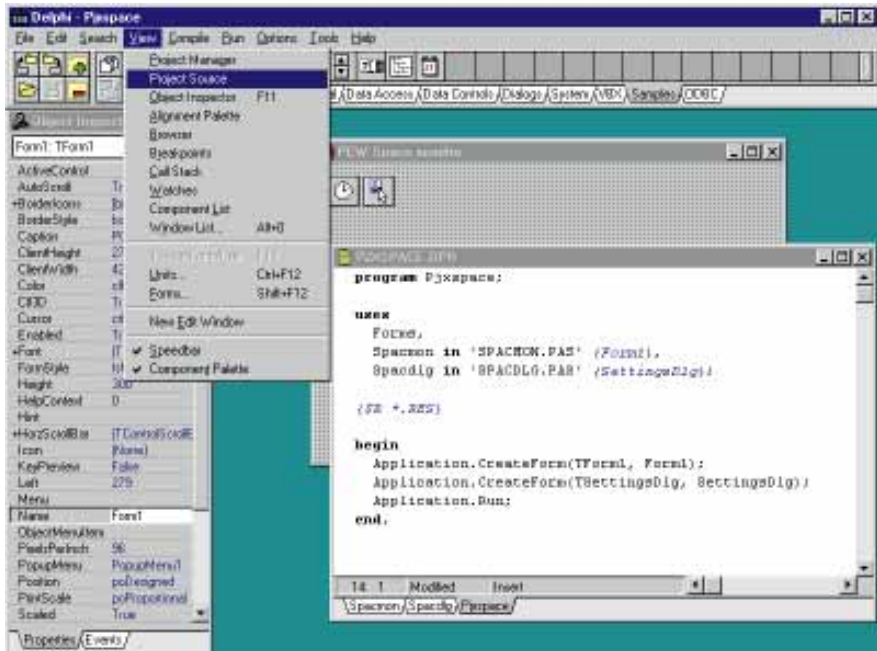


Left The completed space monitor, showing the new dialog in use
Below Open up the project source, and notice that Delphi creates all form objects immediately the application runs. It makes for good performance but heavy use of memory in large projects (see “Delphi quirks and quibbles”)

What this means is that the form object is created when the application first runs, even though the user may never choose to open it. This is good for performance, but bad for resource and memory usage. A good option is to remove this line from the project source, and instead create and destroy the form when you need it.

Finally, a note about the Uses clause. In the example, the dialog sets public variables in its own unit, for reading by the main unit (in which Form1 is declared). But why not have it set public variables in the main unit itself? If you try this, you will find that the dialog unit cannot see any variables declared in the main unit. Further, if you add the main unit to the dialog’s Uses clause, the compiler chokes with Error 68: Circular unit reference.

Generally this means you should rethink the structure of the application, and avoid these circular references. In extremis, you can place a Uses clause in the implementation section, where Delphi will compile a circular unit reference.



PCW Details

All the code for the Space Monitor project, together with an executable anyone can run, is included on the PCW cover disk/CD.
Contact **Tim Anderson** with any comments or tips, at the usual address or email freer@cix.compulink.co.uk

Pentium P120s



To bring out the best — or worst — of these P120 PCs, we adapted our tests to the whims of Windows 95. Adele Dyer takes you through a mixed bag of high-spec machines.

If nothing rises as fast as Pentium clock speeds, then nothing drops as rapidly as their prices. Back in May 95 we reviewed the first P120s on the market: a Gateway and a Viglen. They were high spec machines, but comparable to those in this test. The litmus test of price means it's been worthwhile waiting until now to buy a P120. In May 95 the Viglen Genie PCI P5/120 with a 17in monitor cost £2,999. Now the same machine will cost you only £2,549 — a drop of £450.

For this test we decided on a fairly high spec, but if you choose a decent processor you will naturally want good, fast components to make the most of it. To that end we specified a 1Gb hard drive and 16Mb of RAM. The hardware spread on pages 224/225 goes into more detail as to why you need both of these, but suffice it to say that if you are going to be multitasking in Windows 95 and intend to run anything more than MS Works, you need both of these.

To complete the equation we went for wavetable sound cards, a minimum of 2Mb of VRAM on the video card and a quad speed CD-ROM drive. None of these components are out of the ordinary, and if you're serious about multimedia they're all absolutely necessary if you want to get the most out of your PC.

Finally it was time to convert to Windows 95 tests. Like it or loathe it, Windows 95 is the way of the future. For more details on how we adapted our existing tests, see the panel "How we did the tests" on page 217.

One additional test we ran was a Doom 2 demo. The advantage of this test is that it forces the PC to display every frame in a short, pre-set game demo. This really pushes the processor and the graphics card

and gives a very good indication of how the machine will perform for entertainment purposes.

There are 16 machines here for you to sample. We have done our best to sift the wheat from the chaff and now the final choice is yours.

P120 Contents

- 198** Adams 586 Multimedia System
- 198** Armari eXPS-120plus
- 199** Atlantic Pro95
- 199** Brother BCR 4586P
- 200** Carrera Panther P120AM
- 200** Dan Dantium 95/s 120MM
- 203** Dell Dimension P120MT
- 203** Gateway P5-120 Elite
- 204** Hi-Grade Winputer P120-M
- 204** HP Vectra XM Series 3 5/120
- 208** Olympian Evolution 2000
- 208** Panrix Micron P120
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Adams 586 Multimedia



PC

A good deal of thought has gone into the design and overall package of this machine. The layout inside allows you to see clearly where everything is and, more importantly, to get your hands on it. The Quantum Fireball hard disk lurks at the back with room for a second underneath it. The one we were given to review was 1.1Gb and ran at 10ns, although you can choose to have a 1.2 Conner drive, which is slightly slower, for the same price. At the front there is only room for one more 5.25in device and this is well below the floppy drive and the CD-ROM drive. The CD-ROM drive is well worth noting. The machine we had was a six-speed TEAC. Adams will fit six-speeds as standard on future machines, but these will be by Aztech or Optics Storage. The Micronics motherboard, with Intel Triton chipset, houses the processor complete with Socket 5. The 16Mb of EDO-RAM came with two 8Mb SIMMs running at 70ns and were easy to reach. There are four PCI and four ISA slots; one shared. One ISA slot is taken by the Creative Labs SoundBlaster AWE 32 and one PCI slot by the Matrox Millennium video card. All in all there is nothing to fault on this machine, except perhaps for the price. It has very good performance and is well-equipped — an excellent choice if you have that much money to spend.

Monitor

The Iiyama Vision Master 17 supplied with this system comes as standard with any machine with a wavetable soundcard. It produced an excellent picture and was comfortable running at 1280x1024.

PCW Details

Adams Accura Professional 586 Multimedia System
Price £2,749
Contact 0161 877 8822
Fax 0161 877 8684
Web BBS - 0161 283 9921
Software Bundle OS/2 v3.0 with Lotus SmartSuite, or Windows 95 with Novell Perfect Office
Hardware Bundle SoundBlaster microphone, Yamaha M-10 speakers
Warranty Terms three years parts and labour, first year on-site

Two more years on-site for £150
Technical Support Free telephone and fax support
Good Points Six-speed CD-ROM drive, nice monitor
Bad Points Only one 5.25in expansion bay
Conclusion A solid, well-constructed machine

Armari eXPS-120plus



PC

One of the nicer looking machines in the group test, this was at first one of the easy ones to set up and get going. Armari had partitioned the hard disk, which optimises performance when Windows 95 is installed as an upgrade on top of DOS and Windows 3.1, rather than as a straight installation on a clean hard disk. It overcomes Windows 95's allocation of 32Kb to the smallest cluster on the hard disk. Armari offers you the chance to choose whether or not you want disk partitioning when you buy the machine. However think carefully about this, as once a hard disk has been partitioned it is extremely tricky to unpartition again. Once inside the machine, the high spec soon becomes apparent. The Quantum Fireball EIDE hard disk produced good results - maybe helped by the partition. The EDO-DRAM, pipeline burst cache and Pioneer CD-ROM all point to a well spec-ed machine. The other parts are fairly standard fare, including a Creative Labs AWE 32 and Matrox Millennium video card. There are four PCI and four ISA slots, none of them shared, two free 5.25" front facing expansion bays and one internal 3.5" bay. In tests they gave good results in the Windows sections, although the machine stopped once on the WordPerfect for DOS tests. However, this did not affect its overall performance. The Doom2 tests gave a score of 50 fps.

Monitor

The 15" Iiyama monitor was quite happy to run at 1024 x 768 x 256 non-interlaced. It was crisp and clear with no distortion.

PCW Details

Armari eXPS-120plus
Contact 0181 810 7441
Fax 0181 810 5783
Web <http://www.stec.net/~arminfo>
BBS: 0181 810 8633. For support, BIOS and video card driver upgrades. Free
Software Bundle Windows 95 as standard. Office 95 Pro - £209. MS bundle including Dangerous Creatures, Encarta, Works, Works - £59
Hardware Bundle J888Av or Jazz Hipsters - options

- 30 Watts
Warranty Terms 1st year, back to base. Options - £39 for one year on-site
Technical Support Free telephone and fax support
Good Points Good hard disk, pleasant machine to use
Bad Points Disk partitioning potentially a problem
Conclusion A good machine for a very good price

Atlantic Pro 95



PC

Of all the machines in the test, this stood out in terms of sheer size if not any other criteria. Standing over two foot tall, it dwarfed even the Gateway and was too big to fit on the labs workbench. The room inside is naturally in proportion to the size. It has four 5.25" front-facing expansion bays and one 3.5" bay, as well as one internal bay for an extra hard disk. The components were partly very typical: a Diamond Stealth 64 video card, a Creative Labs AWE 32 sound card, Western Digital hard disk and Triton chip set were found in many of the machines. However Atlantic offered two unusual components, a Vertos CD drive and a SOYO motherboard, neither of which we had seen before. On the downside it was a very noisy machine. Even if you switched off the monitor and covered up the HDD light you could easily monitor the hard disk activity by listening to the rattle and hum. The other negative point about this machine was the inclusion of a trackball instead of a mouse. Admittedly, some may find it a more convenient way of working, but personally I found it cumbersome and inaccurate. The performance offered was fair. It was one of the fastest finishers in the Doom2 tests, but lagged a little on Windows. However the results are quite good overall and if you want a machine with a lot of expansion room, you could do a lot worse.

Monitor

This Samsung monitor ran quite happily at 1024x768 x256, but it was flickery and in DOS it became clear that the red gun was misfiring, giving the characters a spooky red rim.

PCW Details

Atlantic Systems Atlantic Pro95
Price £2,278
Contact 01792 700002
Fax 01792 792888
Software Bundle Windows 95, Lotus SmartSuite, Grolier Multimedia Encyclopedia, Supervoice comms/fax/phone software, games and training bundle.
Hardware Bundle Trust multimedia speakers - 15 Watts
Warranty Terms 1st year on-site parts and labour, further 4

years return to base labour. Optional 2nd and 3rd year on-site.
Technical Support Free telephone and fax support
Good Points Good software bundle, lots of room for expansion
Bad Points Excessive size, noisy hard disk
Conclusion A bit "different", but a decent performer

Brother BCR 4586P



PC

Brother is well known for its business machines, and this machine was aimed more at commercial users than for high-end home use. This was obvious from the moment we took off the top. The sight that greeted us under the lid was not a pretty one. The first anomaly was the position of the parallel and serial ports. One of the parallel ports and one serial port come off an I/O card in one of the ISA slots. There is then a second parallel port at the far end of the expansion slots, but no second serial port. The mouse takes one serial port, leaving you little room for an extra external peripheral such as a modem. The Connor hard drive sits under the floppy drive and under this is a rather inaccessible spare 3.5" bay. Next to this is the Goldstar CD-ROM drive on top of a spare 5.25" bay. Unfortunately the CD and floppy drives are so close together you have to take out the floppy and hard disk bays and then take out the CD-ROM drive to put extra equipment in the free 5.25" bay. The hard disk and CD-ROM were strung together on the same IDE chain, which adversely affects performance. The four 4Mb SIMMs were in a tight spot with one end just under the power pack and the other jammed against the Taxan video card. It's not exactly Plug and Play, but this machine is not without its compensations. There is an IRDA connection on the front of the case.

Monitor:

Brother BM 84L EPA/energy star monitor was happy enough to run non-interlaced at 1024x768, but the picture was a little distorted graphically on a trapezoid shape.

PCW Details

Brother BCR 4586P
Price £1,999
Contact 01279 416888
Fax 01279 418130
Software Bundle Windows 95
Hardware Bundle SP-868 multimedia speakers
Warranty Terms 1 year on-site
Technical Support Free telephone and fax support

Good Points IRDA connection on front of case
Bad Points Hard disk and CD-ROM drive on same IDE chain
Conclusion Cheap, but has the lowest spec in the group test

Carrera Panther P120AM



PC

The door on the front of the case is the one distinctive mark of a Carrera. However, once inside the machine, it turned out to be quite different to the P90 we looked at in September.

Once the case is off, this machine proved to be well constructed. Almost everything was well placed, easy to reach and so to upgrade.

There were three free expansion bays: one 5.25" front-facing, one 3.5" front-facing and an extra internal bay. Unfortunately the amount of space this left in a small case did not allow the RAM to be put in a convenient place. If you wanted to get out of the RAM and upgrade it, you would have to poke under the floppy and hard disks to get your fingers to the clip.

There were four PCI and four ISA slots, none of them shared. VRM was included on the Super motherboard, as was Socket 7 and, of course, Triton. Other than the problem with the RAM, all the components were easy to reach and the motherboard was clean and clear.

The benchmark tests confirmed that this was a very respectable machine. The Doom2 test gave a result of 50fps and the machine was one of the fastest finishers in the DOS tests. Like many of the speedier machines in this test, the Carrera was fitted with the very fast Quantum Fireball, which will have made a considerable contribution to producing these results. Considered with the good software bundle, this is a good machine for the price.

Monitor

This Goldstar monitor has the standard controls, but no pincushion or barrel - a shame as the monitor has a tendency to warp. Otherwise though it run well at 1024 with no flicker or interlacing.

PCW Details

Carrera Panther P120AM	Good Points Lots of room for expansion in a small case
Price £1,999	Bad Points RAM hard to reach
Contact 0171 830 0586	Conclusion A nice little runner
Fax 0171 830 0286	
Software Bundle Windows 95, MS Works, PC Check diagnostics software	
Hardware Bundle Typhoon sound system speakers	
Warranty Terms 1 year parts and 3 years labour back to base. On-site available	
Technical Support Free telephone support - no fax support	

Dan Dantium 95/s 120MM



PC

This is a no fuss machine. The case is plain but not austere and takes a bit of a tug to get it off, but inside everything is clearly visible and within easy reach.

The Quantum EIDE hard drive sits right at the top of the case and under this are two free 5.25", front facing, accessible bays. Under this is the Toshiba quad-speed CD-ROM drive, followed in descending order by the floppy drive and finally a free 3.5" bay.

The motherboard was twinned with Intel Triton chipset and the processor fitted with Socket 7 and 256k of pipeline-burst cache. The two 8Mb EDO-RAM SIMMs were easy to reach. There were two more SIMMs sockets for further expansion.

To round off the spec, Dan had fitted a Creative Labs SoundBlaster AWE 32 sound card and a Diamond Stealth 64 Video VRAM video card. This left room for expansion in two free ISA slots (one shared with a PCI slot) and two free PCI slots, one of which was extended.

As was common in those machines with both a Diamond Stealth 64 Video VRAM card and a Quantum hard drive, the Dan did well at the Doom2 tests, finishing fifth.

Altogether the machine was well constructed and would be a doddle to upgrade. It comes with an extensive software bundle and good speakers, which make the whole package very reasonable.

Monitor

The Dan has a CTX monitor which ran quite happily at the test resolution of 1024x768 non-interlaced. It has all the standard controls, including pincushion and barrel.

PCW Details

Dan Dantium 95/s 120MM	Technical Support
Price £2,071	Free telephone and fax support
Contact 0181 830 1100	Good Points Well constructed, good software bundle
Fax 0181 830 1122	Bad Points Keyboard was slightly spongy
Software Bundle Windows 95, Lotus Bundle, Works 95, Encarta 95	Conclusion A very good machine for the price
Hardware Bundle AT 75 - 80 watt	
Warranty Terms Lifetime (1st year full back to base, parts and labour). Extended warranty 8% of PC value per year	



Dell Dimension P120MT



PC

Dell has a reputation for solid machines, backed up by excellent support. This machine was no exception. It was the highest scorer in the Doom2 tests and came with the most comprehensive troubleshooting manual.

As an OEM manufacturer Dell produces its Aown motherboards and some components, including a huge 512kb cache card. It was notably the only manufacturer to include so many kb of cache. While the argument rages about the diminishing returns of larger cache sizes (the larger the cache, the longer the search time), Dell argues it has tried to increase the overall speed of the machine by putting in the fastest possible individual components. More cache does not make that much difference to operating systems like Windows 3.1, but it does help when multitasking, so enhancing Windows 95 and OS/2 performance.

The other components, including the Intel Triton chipset and the Creative Labs AWE 32, were quite standard. Room for upgrading was limited to two 5.25in free front-facing expansion bays and one internal 3.5in expansion bay. There were four PCI and four ISA slots, one shared, with three of each still free.

Interestingly, the results for Doom2 rated the Dell higher than the benchmark tests. This may have been due to the fast Quantum Fireball hard disk and the Number Nine Technology graphics card.

This machine was also nicely kitted out with extras. Office Pro comes pre-loaded and on CD-ROM, while the Altec Lansing speakers are powerful and give good reproduction.

Monitor

The Dell had its own proprietary monitor — a rebadged Lit-On. It ran 1024x768 comfortably, without interlacing, and was pleasant to use. It had all the standard controls including pincushion and barrel.

PCW Details	
Dell Dimension P120MT	Technical Support
Price £1,999	Free telephone and fax support
Contact 01344 720000	
Fax 01344 723695	
Software Bundle Windows 95, Office 95 Pro	Good Points Good initial support, software bundle
Hardware Bundle Altec Lansing ASC31 speakers	Bad Points Limited expansion bays
Warranty Terms One year collect-and-return	Conclusion A very well-specced machine
Options Up to four years on-site or four years collect-and-return	

Gateway P5-120 Elite



PC

At first glance you could be forgiven for mistaking this machine for a server, not a humble tower PC. It is vast. At about three times the size of the average mini-tower in this test the Gateway, not surprisingly, had three times the expansion room.

As could be expected in such a large case, the three front-facing expansion bays and two free bays at the rear have plenty of space around them, so you won't have to reach for the crowbar if you want to fit new kit .

Similarly, elsewhere in the machine everything is well laid out and easily accessible. I was surprised there were not more expansion slots — a measly three ISA and four PCI slots, one of which is shared. In these sit one of the more unusual sound cards: the Ensoniq Opus Wavetable. Ensoniq have a good reputation for their sound cards and this one is no exception.

Unfortunately we had problems with the graphics card and the monitor. At base the proper drivers had not been installed, so although the graphics card was driving the monitor, it was impossible to change the settings. So although you could set the monitor in Windows 95 to run 1024x768 in SVGA, nothing happened at the monitor end.

The hard disk is worth a mention as it was by far the largest in the test. We asked for a 1Gb disk and were sent a 1.6 Gb Western Digital, which obviously performed well in the tests. Likewise the graphics card still performed well in the Doom2 tests, despite the monitor problems.

Monitor

A very good, flat 17in screen with programmable features to allow several modes of operation. This makes it easy to adjust by swapping between modes.

PCW Details	
Gateway P5-120 Elite	Technical Support
Price £2,299	Free telephone and fax support
Contact 0800 602000	
Fax 00 353 1 848 2022	
Software Bundle Windows 95, Office 95, Encarta 95	Good Points Excellent monitor, large hard disk, very fast performer
Hardware Bundle Altech Lansing speakers	Bad Points Monitor not set up properly at base
Warranty Terms One year on-site, two years BTB. Extended warranty — second and third year on-site	Conclusion A very good machine, competitively priced

Hi-Grade Winputer P120-M



PC

Someone at Hi-Grade did not want me to get into this machine. The screws had obviously been put in with a power screwdriver and were in so tight the paint flaked off when I went to take the back off this mini-tower.

Once inside, the Hi-Grade is quite logically made up. There is plenty of space amongst the drive bays to fit extra devices in the single 5.25in and two 3.5in free front-facing expansion bays. Unlike Hi-Grades on other machines, the Seagate hard drive stays firmly in place on this model, as unfortunately no-one makes mode 4 removable hard drives.

On the motherboard everything is easy to reach and so to upgrade. The Triton chip set is helped on its way by Socket 7 and VRM. The RAM is standard RAM running at 60ns. Hi-Grade are happy to supply you with EDO if you want it, but quite rightly reckon that with caching EDO RAM, which runs at 70ns, has only minimal advantage over standard cache. Pipeline synchronous can be included for an extra £55.

Otherwise there are only three ISA, and four PCI, slots — one of them shared. Nestling in here is the added bonus of a US Robotics 14.4 modem: a useful inclusion.

Interestingly this machine did much better on the Doom2 tests than on the Windows and DOS tests, demonstrating the benefit of a good graphics card.

Unfortunately only the basic operating system is included in the price.

Monitor

Hi-Grade were one of the few to supply a 17in monitor. Unfortunately the Panasonic monitor was flickery, had very few controls and winced visibly when switched on and off during the DOS tests.

PCW Details

Hi-Grade Winputer P120-M

Price £2,370
Contact 0181 591 9040
Fax 0181 591 1586

Software Bundle Windows 95 or DOS 6.22 and Windows 3.11
Hardware Bundle SV37

Warranty Terms One year return to base. One year on-site — £25, subsequent years — 7% of purchase price

Technical Support Free telephone support, no fax support

Good Points Internal modem, plenty of room for expansion
Bad Points Disappointing monitor, only standard RAM and cache
Conclusion A sound machine, if not a speed devil

HP Vectra XM Series 3 5/120



PC

Better known for their printers than for their desktops, Hewlett Packard also manufacture their own PCs. That is, they make their own motherboards rather than simply assemble other people's bits.

Inside the layout of the HP is something of a surprise. The case is split down the middle with all the drives on one side and the hard-wired components on the other. The hard disk nestles at the back with a fair amount of space around it, but no free expansion bays. In front there is just the one 3.5" free front facing expansion bay.

On the other side lies the HP motherboard. To get to it you have to lift up the power pack which sits over the top like a protective arm. You can move this out the way by slipping it out of its slot and moving it over to one side. The motherboard has built-in ports, video and non-standard keyboard and mouse ports.

The three of the six SIMMs slots were taken by two 4Mb and one 8Mb SIMMs of EDO-DRAM. The processor is held in place with a Socket 7 ZIF socket and there is VRM.

At a 90 degree angle to the motherboard are three ISA and two PCI slots (one shared). Getting the screws out to put in a network was a bit of a fight. The screws used are not standard issue PC screws, but have an extra washer on them. Two of the four came out quite easily, but it took me 20 minutes to prize out just one of the others.

Monitor

This 15" HP monitor ran flicker free at 1024x768 for the tests, but is capable of 1280x1024. It has a good flat screen and is easy on the eyes.

PCW Details

Hewlett-Packard Vectra XM Series 3 5/120

Price £2,740
Contact 01344 369222
Fax 0171 735 5565

Software Bundle DOS 6.22, Dashboard 2.01, Windows 95 or Windows 3.11 (user chooses at boot)

Hardware Bundle HP speakers

Warranty Terms 3 years (1year on-site, 2nd and 3rd year BTB). 2nd and third year on-site with HP support pack

Technical Support Free telephone support. Fax support in USA only

Good Points Lots of SIMM slots

Bad Points Expansion slots hard to get at and only one 3.5" expansion bay

Conclusion A business machine, not a personal, multi-media machine, but quite pricey



Olympian Evolution 2000



PC

This company was new to PCW. They have been around for four years, but this is the first time we have reviewed one of their machines. Despite the name they give to their PCs they are not to be confused with Evolution. The Evolution badge instead refers to Olympian's lifetime labour guarantee, which includes free fitting of any upgrades.

Sitting on the TMC motherboard are the Triton chip set, Socket 7 ZIF socket and VRM. Two of the four available SIMMs slots are taken by 8Mb of EDO-RAM, and these are hidden under the ribbon cables, but are otherwise quite easy to reach.

There are two free expansion bays. The first, a 5.25" bay is wedged between the Mitsumi CD drive and the floppy and the 3.5" bay is between the floppy drive and the hard disk. There are no internal expansion bays.

We tested the machine with a Seagate hard disk, but Olympian are replacing this with a Quantum Fireball - a disk that tested very well and produces much faster results.

Although not one of the fastest machines in the test, it did turn out to have several plus points. It was extremely easy to set up for the tests and introduced no hitches along the way, suggesting the machine had been well configured at base. It ran the Doom2 tests well, although the benchmark test results were less earth-shattering.

This was a pleasant machine to use all round, and it hums along at a respectable pace.

Monitor

The ADI monitor has an LCD to select the controls, including pincushion, trapezoid and barrel. It is reasonably flat, ran 1024x768 without a hitch and is energy efficient.

PCW Details	
Olympian Evolution 2000	Good Points Pleasant to use, good guarantee offered
Price £1,999	Bad Points Limited software bundle
Contact 0181 880 4222	Conclusion A solid machine
Fax 0181 880 4222	
Software Bundle Windows 95 or DOS 6.22 and Windows 3.11	
Hardware Bundle None	
Warranty Terms Lifetime labour and 1 year on-site parts and labour	
Technical Support Free telephone and fax support	

Panrix Micron P120



PC

One should never judge a computer by its case and this is true of the Panrix Micron P120. It is the same midi-tower case with which we have been familiar over past models but this baby packs a greater punch. The Micron P120 has the usual external accoutrements such as the two serial and one parallel port, PS/2 plugs for the Microsoft mouse and keyboard, and a Sony CDU 76E quad-speed CD-ROM.

Once you open the case you'll find a spacious and clear interior. No obstruction exists in getting to the three PCI and four ISA slots (one of which is shared). There are two free 5.25in expansion bays and one internal 3.5in bay.

The Micronics motherboard holds an Intel P120, Triton chip set, and 256K Pipeline cache. The 1GB Quantum Fireball hard drive, with 10ms access, and the CD-ROM are supported by the primary and secondary EIDE on-board controller which helps add to the speed of this machine.

Occupying three of the available seven slots are a Matrox Millenium video card with 2Mb of RAM in the first PCI slot, and a Creative Labs Vibra 16 sound card in the top ISA slot. The bonus card in the pack is the US Robotics Sportster 14,400 fax/modem card which sits in the bottom ISA slot. If you're looking for a speedy, although not cheap, machine with a clean look this could be the one for you.

Monitor

An Iiyama Vision Master 15, with a nice flat screen and the expected pincushioning/barrelling and degaussing controls. For another £280, you can upgrade to a 17in monitor.

PCW Details	
Panrix Micron P120	site. Option of three years on-site at eight percent of system cost
Price £2,350	Technical Support Free phone and fax support
Contacts 01132 444958	Good Points Fast and well assembled
Fax 01132 444962	Bad Points Tinpot keyboard
email 70630.2724@compuserv.com	Conclusion A very good machine all round
Software Bundle Windows 95, Office 95, Bookshelf, and Delrina 4 in 1	
Hardware Bundle Mouse, keyboard, Trust Multimedia Sound-wave 10 speakers, 15in Iiyama monitor	
Warranty Terms Two years on-	

Simply Computers P120



PC

This machine gave us the most trouble of any machine in the test. It refused to see three different network adaptors under Windows and gave a hard disk controller error when we finally attempted to use a 3Com card. Simply Computers admitted they had had problems with this card in the past and advised us to try something else. Eventually we used an SMC card installed under DOS.

Inside the mini-tower case everything was a little squashed. There was one free 5.25in expansion bay and two more 3.5in free bays — one internal and one external. Getting to the free 3.5in bays would be difficult as they are close up against the power supply.

The bays reach right down onto the motherboard and make everything here seem a little too close for comfort. There are four PCI and four ISA slots, none shared. The EIDE ribbon cables all come down to connect to the motherboard in the middle of the slots and so would have to be disconnected to put in a PCI card. Solidly buckled power cables snake across the inside of the machine, so getting anything into the PCI slots requires very careful manoeuvring. There is no room for a full length card here.

When it came to the tests we had difficulties running the Word-Perfect for DOS test and eventually had to run it from a DOS boot — it refused to run from a DOS prompt box within Windows 95 as not enough memory had been allocated to run DOS applications.

Monitor

This CTX monitor, a popular choice in this test, had no problems running at 1024x768 in 286 colours. It has a nice, narrow surround and a good range of controls.

PCW Details

Simply Computers P120	Good Points US Robotics 14.4 modem
Price £2,119	Bad Points Where do we start?
Contact 0181 523 4120	Conclusion Don't buy it
Fax 0181 523 4002	
Software Bundle Windows 95	
Hardware Bundle Creative Labs ProDigital speakers	
Warranty Terms First year On-site, further 4 years back to base. Options: 2nd and 3rd year on-site	
Technical Support Free telephone and fax support	

Vale Triton Platinum



PC

No need to tell you the chip set, as Vale draws your attention to it in the name of the machine.

We initially had problems with this machine. It started well enough, but the longer we had it running, the less it would do, including boot from a DOS diskette. An engineer came in from Evesham Micros, and it turned out that the problem had been a jammed fan on the processor. The heat sink was too small to defuse the heat and the whole machine seized up.

Another factor that counted against the Vale was the way the Creative Labs SoundBlaster AWE 32 overlapped the processor ZIF socket. These sound cards are admittedly very long, but its position was at best unusual and at worst irresponsible.

There were only three ISA and four PCI slots, one of them shared and again on the upgrade side there was only one 5.25in expansion bay.

Once we had overcome the initial difficulties, the Vale had no trouble running the Doom2 tests, coming out with an excellent score — worth noting as many people think running Doom is the most reliable way of testing a PC. It did not do so well on the other tests — perhaps because the Seagate hard disk and Toshiba CD were on the same EIDE chain.

The software package included is comprehensive, however, including Windows 95, Works, and a multimedia bundle.

All in all it ran quite well, but the hardware problems were enough to make us think seriously about its overall reliability.

Monitor

A reduced number of controls on this monitor made it initially confusing to see how to set the screen size. Otherwise it was flickery at 1024x768.

PCW Details

Vale Triton Platinum	Good Points Good hard disk and software bundle
Price £2,124	Good Points Some very strange build decisions
Contact 01386 765500	Conclusion A potentially good machine marred by suspect build quality
Fax 01386 765354	
Software Bundle Windows 95, Vale Media 95	
Hardware Bundle Zydec multimedia speakers	
Warranty Terms One year on-site, second year £69; second and third year £169	
Technical Support Free telephone and fax support	

Viglen Ultimate MultiMedia 120 PC



PC

When you open the box for this machine, the first thing you come across is a very useful sheet telling you exactly how to assemble the various components. Included on this, helpfully, is the technical support line number.

Having taken off the knobbly looking case, the internal components are easy to see. This is partly because the ribbon cables have been kept to a minimum, so there isn't an excessive amount of plastic cluttering up the place.

At the front of the case there are two free front-facing 5.25in bays over the TEAC CD-ROM drive. Below this is the floppy drive and then one free front-facing 3.5in bay before you reach the Quantum Fireball hard disk.

The two 8Mb RAM SIMMs are right under the hard disk and would be tricky to replace without taking out the hard disk. The other two free SIMMs sockets are jammed up against the HDD and could also be difficult to get to, but fitting extra RAM in these slots would not involve dismantling your machine.

There are four PCI slots and three ISA slots, including one shared slot. In these sit a Creative Labs SoundBlaster AWE 32 soundcard and a Diamond Stealth 64 Video VRAM videocard.

The Viglen was one of the fastest machines on the Doom2 tests and ran the benchmarks well. The addition of a six-speed CD-ROM drive adds to the overall performance of the machine.

By the time this review goes to press Viglen will be including a fax/modem as standard.

Monitor

Viglen supply their own monitors. This one was interlaced at 1024x768, but at lower resolutions it is not glare-ridden. For an extra £240 you can upgrade to a 17in monitor.

PCW Details

Viglen Ultimate MultiMedia 120 PC	details call 0181 758 7000
Price £2,704	Technical Support Free telephone and fax support
Contact 0181 758 7000	Good Points Six speed CD as standard
Fax 0181 758 7080	Bad Points RAM hard to reach
Software Bundle Windows 95, MS Works 95, Encarta, Musical instruments, Golf, Money, Publisher	Conclusion A well kitted-out machine, but quite pricey for the performance it offers
Hardware Bundle Speakers, microphone	
Warranty Terms One year return-to-base. Numerous options for extended warranty — for	

Western Systems Power Pro 120



PC

This little desktop was the cheapest machine in the test, perhaps because it does not go for flash components. It obviously opted for the Triton chip set and a Seagate hard drive, but there the similarities with parts chosen by other manufacturers come to an end.

The machine we had for review did not include EDO RAM or pipeline burst cache. However both of these are available. To upgrade you pay an extra £10 per Mb for EDO RAM and £45 for pipeline burst cache. This does of course affect the price considerably. For 16Mb of EDO RAM and the upgraded cache, the cost of the whole unit goes up to £2,091.

The CD-ROM drive and sound card are both by Reveal and the video card is by VideoLogic. Reveal and Western Systems are names that are often linked, with the former best known for its upgrade kits. VideoLogic, meanwhile, makes some very good cards, especially their Rapier range. The one tested here is an entry level card, but still performed nicely.

The layout is surprisingly clear for such a small machine. Everything is logically placed and easy to reach.

While not one of the quickest machines in the test, it nevertheless did reasonably well, and on the Doom2 test it came out with a very respectable score. The DOS scores were not that good, but were balanced out by better Windows results.

If you can live with the lack of EDO RAM, and the limited software bundle, this machine offers a good price/performance compromise.

Monitor

The CTX monitor was capable of operating at 1024x768 at 80Hz, and was crisp, clear and flicker-free. The surround is narrow, allowing maximum viewing space for the area.

PCW Details

Western Systems Power Pro 120	Good Points Good video card, bargain price
Price £1,886	Bad Points No software bundle included — operating system only
Contact 0181 842 0071	Conclusion Performs well for such an inexpensive machine
Fax 0181 841 3891	
Software Bundle Windows 95	
Hardware Bundle Reveal Computer speakers	
Warranty Terms One year on-site, optional second and third year on-site	
Technical Support Free telephone and fax support	

Editor's Choice



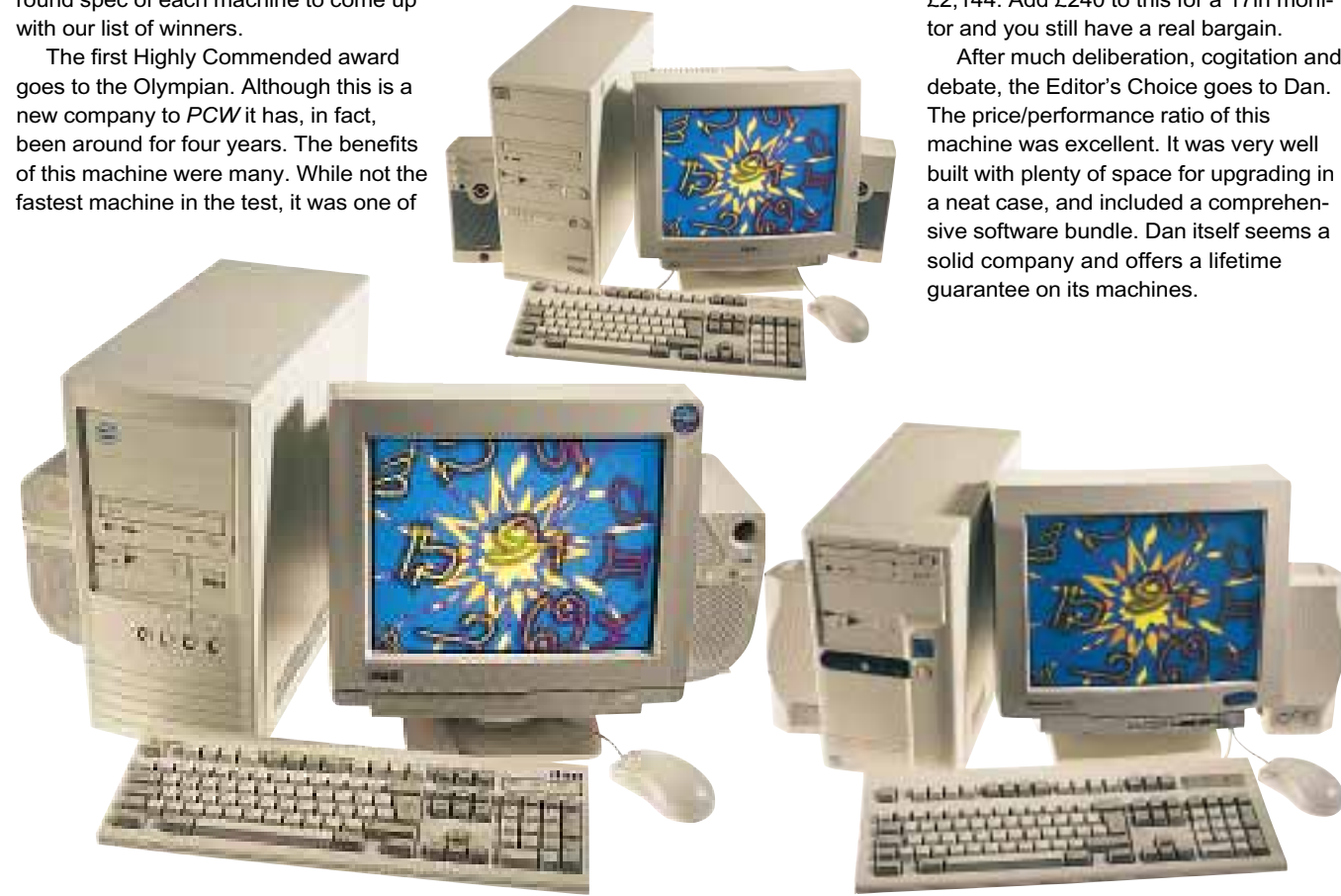
There is more to a good machine than raw speed. In deciding which of this bunch of P120s come away with awards, we looked at the overall picture. Many of the better machines were very close in relative performance and so we have taken into consideration price, guarantee, build quality, software bundles and all-round spec of each machine to come up with our list of winners.

The first Highly Commended award goes to the Olympian. Although this is a new company to *PCW* it has, in fact, been around for four years. The benefits of this machine were many. While not the fastest machine in the test, it was one of

the few to run seamlessly all that we asked it to do. But the greatest factor in its favour is the lifetime labour guarantee. This includes upgrades, so if in future you decide to install new peripherals you only have to pay for the parts and Olympian will do all the hard work free of charge.

Viglen wins the second Highly Commended award for its very high spec machine. This was one of only two we saw with a six-speed CD-ROM drive. In addition it had a fast Quantum Fireball hard drive, a more than adequate Diamond Stealth 64 Video VRAM and good software, all for a very reasonable £2,144. Add £240 to this for a 17in monitor and you still have a real bargain.

After much deliberation, cogitation and debate, the Editor's Choice goes to Dan. The price/performance ratio of this machine was excellent. It was very well built with plenty of space for upgrading in a neat case, and included a comprehensive software bundle. Dan itself seems a solid company and offers a lifetime guarantee on its machines.



Buyer's Guide

By opting for a Pentium you're already looking to the future. The old 486 chips are due to be phased out very shortly and, apart from the workstation Pentium Pro, Intel have not come up with a Pentium replacement.

However, when you buy a PC there is more to the deal than a machine you can boast about to your friends in the pub. As with any piece of electronic equipment, the warranty is vital, and so is the backup in the shape of technical support. Also, there is the software, which, if not bundled with the machine, can be costly to acquire.

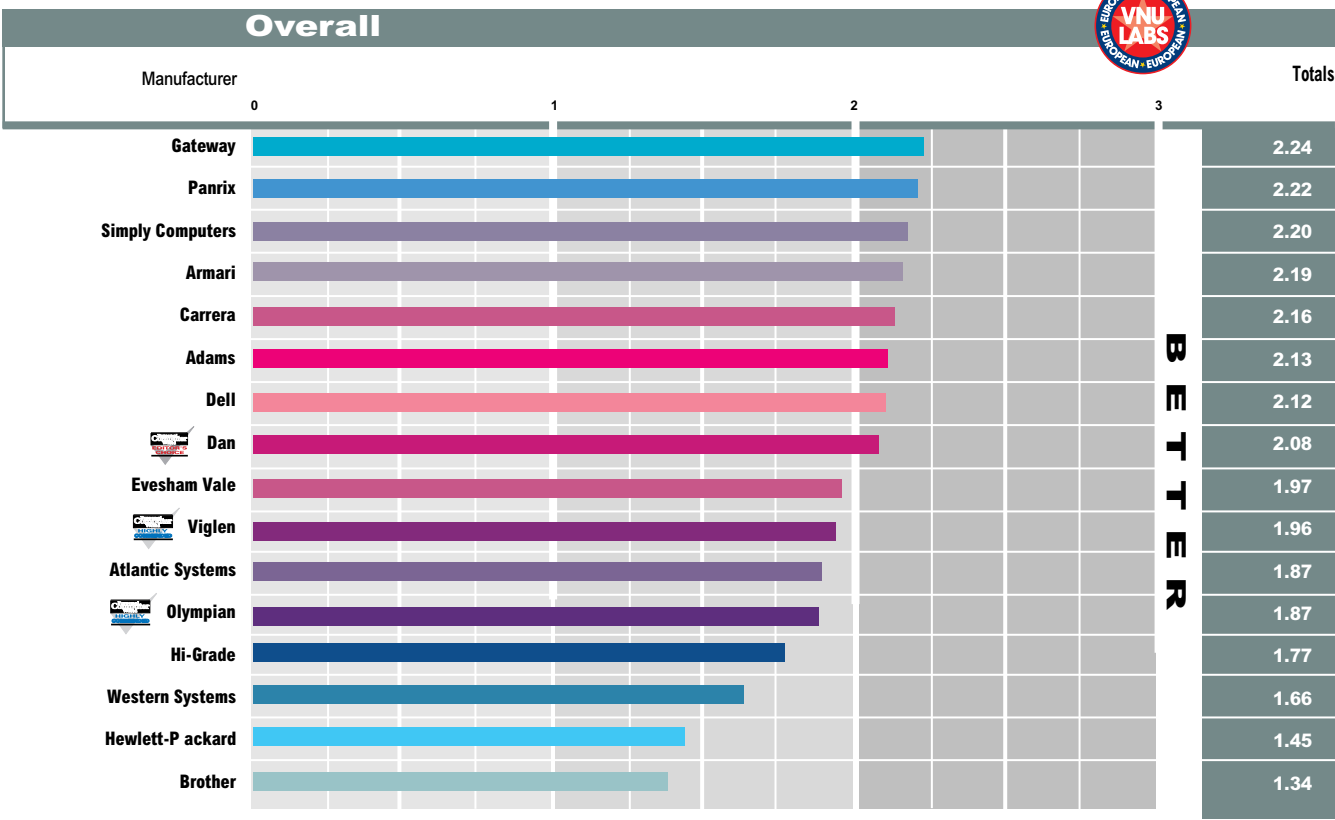
Warranty options vary wildly. Manufacturers offer either back-to-base or on-site repairs. Your decision as to which to opt for depends very much on how you use your PC. If you depend on it for your livelihood it might be worth discussing guaranteed call-out response times with the manufacturer. Armari, for example, offers an optional eight hour response on top of their standard

guarantee. Other manufacturers, such as Dan and Olympian, offer lifetime labour guarantees, with the latter covering the labour costs involved in upgrading your PC so that you only have to pay for the upgrade kit. Optional extra years may be worth considering, especially for PC beginners.

Software bundles are a vexed question. Many smaller manufacturers don't offer bundles within their stated prices because they can't negotiate the same kind of deals as the larger companies. However, the price advantage gained by buying a non-bundled machine can be erased if you have to buy the large office packages separately. Think carefully about what you need. Some of the integrated packages are quite adequate for most people's needs, while the multimedia bundles are often regarded as a tad unnecessary by others.

The cost of the machine is affected by all these considerations, and there is no one answer. What is important is to find a deal that suits your requirements.

Performance Results



RELATIVE: COMPAQ DESKPRO DX4/100, 16Mb RAM = 1.00

How we did the tests

Like the previous VNU Windows and DOS tests, these Windows 95 performance figures are based on the throughput of standard application programs. While there are strong similarities with the old tests, the results are not comparable for two reasons. Firstly, the base platform (with a reference score of one) has shifted to a 486 DX4-based Compaq Deskpro system. Secondly, the numbers are weighted and calculated differently.

Although DOS programs are still tested, they now have a lower weighting. The DOS figures are merged into the overall score rather than being presented separately. Under Windows 95 they run in a DOS box — essentially a Windows-based environment.

Previous lab tests used a normalised test platform that included changes to the swap file and other system settings. To better reflect how manufacturers supply machines for review, we now keep reconfiguration to a minimum, specifically, installation of PostScript printer drivers and disabling of the undelete facility in the



Recycling bin.

This has highlighted speed variations across relatively similar hardware platforms. Although the processors in all these machines are identical and all have 16Mb of RAM, there is an overall difference of almost one point between the fastest and slowest. Careless software installation makes a dramatic difference in Windows 95: like a bad apple, one 16-bit driver loaded for a sound card or






display adapter can cripple performance across the entire application suite. We also encountered several machines that are still using old DOS TSRs and these generally performed

worse than the “cleaner” installations on the top eight machines.











Finally, we ran a Doom test for the first time. This consists of a short demo run lasting about two minutes, and is intended to test the hard disk and the graphics card — no frames are dropped. The final score (of realtics) is divided by a constant (gametics) and multiplied by 35 to give a frames per second rate. For a consistent condition we ran it at full screen and without sound.













Julian Evans



P E N T I U M 1 2 0 M H Z T A B L E O F F E A T U R E S					
	Adams	Amari	Atlantic	Brother	Carrera
Manufacturer	Adams Technology	Armari	Atlantic	Brother Computers	Carrera
Model Name	Professional 586 Multi Media System	eXPS-120plus	Atlantic Pro95	Professor P120	Carrera Panther P120AM
Tel No	0161 877 8822	0181 810 7441	01792 700002	01279 416888	0171 830 0586
Fax No	0161 877 8684	0181 810 5783	01792 792888	01279 418130	0171 830 0286
Price (excl VAT)	£2,749	£2,143	£2,278	£1,999	£1,999
Basics					
Processor Manufacturer and Model	Intel Pentium 120	Intel Pentium 120	Intel Pentium 120	Intel Pentium 120	Intel Pentium 120
Expansion Bus					
Local bus Architecture	PCI	PCI	PCI	PCI	PCI
Free local bus only slots	3	3	3	3	3
Free ISA only slots	3	3	3	2	3
Free shared local Bus/ISA slots	1	0	0	0	0
Motherboard Manufacturer	Micronics	Supermicro	SOYO	Brother	Supermicros
Chipset	Triton	Triton	Triton	SIS	Triton
No. of spare 3.5" bays	1	1	1	0	1
No. of spare 5.25" bays	0	2	4	2	1
Hard disk					
Manufacturer	Quantum	Quantum	Western Digital	Conner	Quantum
Size	1.1Gb	1Gb	1.2Gb	1.275Gb	1.1Gb
Interface	EIDE	EIDE	EIDE	IDE	EIDE
Average access time (ms)	10	12	11	14	10
RAM and Secondary Cache					
Main RAM	16Mb	16Mb	16Mb	16Mb	16Mb
Max RAM	128Mb	128Mb	128Mb	128Mb	128Mb
RAM Type	EDO	EDO-DRAM	EDO	Standard	EDO
SIMM Type (pins)	72	72	72	72	72
Secondary cache (Kb)	256Kb	256Kb	256Kb	256Kb	256Kb
Max secondary cache (Kb)	512Kb	512Kb	512Kb	256Kb	512Kb
Cache type	Synchronous SRAM	Pipeline Burst	Pipeline Burst	Writeback	Pipeline Burst
Multimedia					
CD-ROM Manufacturer	TEAC	Pioneer	Vertos	Goldstar	Mitsumi
CD-ROM Model	cd-56e	UA124X-5	400	GS540B	FX400
CD-ROM Speed	6X	4X	4X	4X	4X
Sound Card Manufacturer	Creative Labs	Creative Labs	Creative Labs	Creative Labs	Creative Labs
Sound Card Model	Sound Blaster AWE 32	Sound Blaster AWE 32	Sound Blaster AWE 32	Vibra 16	Sound Blaster AWE 32
Graphics					
Graphics Card Manufacturer	Matrox	Matrox	Diamond	Taxan	Matrox
Graphics Card Model	Millennium WRAM	Millennium WRAM	Stealth 64 Video VRAM	GTS 1280	Millennium WRAM
Graphics Card RAM/Max RAM	2Mb/8Mb	2Mb/8Mb	2Mb/4Mb	2Mb	2Mb/8Mb
Graphics Card					
Max non-interlaced resolution	1600x1200x256 @ Hz	1600x1200x256 @ 85Hz	1024x786x256 @ 70Hz	1280x1024x256 @ 74Hz	1600x1200x256
Monitor Manufacturer	Iiyama	Iiyama	Samsung	Brother	Goldstar
Monitor Model	MF8617	8115	15GL	BM84L	1520DM
Monitor Size	17	15	15	15	15
Monitor Maximum					
Refresh Rate at 1024x768 (Hz)	100Hz	72Hz	72Hz	80Hz	75Hz
Free tech support line	●	●	●	●	●
Fax support	●	●	●	●	○
Company turnover					
(most recent figures available)	£3 million	£ 950,000	£20 million	\$1.6 billion	£9.6 million
Number of staff	16	8	81	5000	52
					
KEY ● Yes ○ No					



P E N T I U M 1 2 0 M H Z T A B L E O F F E A T U R E S					
	<div>Dan</div> <div></div>	<div>Dell</div> <div></div>	<div>Evesham Micros</div> <div></div>	<div>Gateway</div> <div></div>	<div>Hewlett-Packard</div> <div></div>
Manufacturer Model Name	Dan Technology Dantium 95/s120MM	Dell Dimension P120MT	Evesham Micros Vale Platinum Triton	Gateway 2000 P5-120 Elite	Hewlett Packard HP Vectra VL5/120 model 84
Tel No	0181 830 1100	01344 720000	01386 765500	0800 602000	01344 369222
Fax No	0181 830 1122	01344 723695	01386 765354	003531 848 2022	0171 735 5565
Price (excl VAT)	£2,071	£1,999	£2,124	£2299	£2,740
Basics					
Processor Manufacturer and Model	Intel Pentium 120	Intel Pentium 120	Intel Pentium 120	Intel Pentium 120	Intel Pentium 120
Expansion Bus					
Local bus Architecture	PCI	PCI	PCI	PCI	PCI
Free local bus only slots	2	3	2	3	1
Free ISA only slots	1	3	1	2	2
Free shared local Bus/ISA slots	1	1	1	1	1
Motherboard Manufacturers	Dan	By Intel to a Dell design	Intel	Intel	HP
Chipset	Triton	Triton	Triton	Triton	VLSI 82C591/2
No. of spare 3.5" bays	2	1	2	3	1
No. of spare 5.25" bays	2	3	2	3	0
Hard disk					
Manufacturer	Quantum	Quantum	Seagate	Western Digital	Western Digital
Size	1Gb	1Gb	1Gb	1.6Gb	840Mb
Interface	EIDE	EIDE	FAST ATAZ	EIDE	EIDE
Average access time (ms)	10	11	10.5	9	10
RAM and Secondary Cache					
Main RAM	16Mb	16Mb	16Mb	16Mb	16Mb
Max RAM	128Mb	128Mb	128Mb	128Mb	192Mb
RAM Type	EDO	EDO	EDO	EDO	DRAM
SIMM Type (pins)	72	72	72	72	72
Secondary cache (Kb)	256Kb	512Kb	256Kb	256Kb	256Kb
Max secondary cache (Kb)	512Kb	512Kb	512Kb	256Kb	256Kb
Cache type	Pipeline Burst	Pipeline Burst	Pipeline Burst	Pipeline Burst	Direct mapped *
Multimedia					
CD-ROM Manufacturer	Toshiba	Mitsumi	Toshiba	Mitsumi	Sony
CD-ROM Model	XM 5302B	FX-400	XM 5302B	FX-400	CDU76-E
CD-ROM Speed	4X	4X	4X	4X	4X
Sound Card Manufacturer	Creative Labs	Creative Labs	Creative Labs	SoundScape	Creative Labs
Sound Card Model	Sound Blaster AWE 32	Sound Blaster AWE 32	Sound Blaster AWE 32	Ensonx Wavetable	Vibra 16
Graphics					
Graphics Card Manufacturer	Diamond	No 9 Technology	Diamond	ATI	Cirrus Logic
Graphics Card Model	Stealth 64 Video VRAM	Motion 771	Stealth 64 Video VRAM	MACH 64 VRAM	CL-5434 on PCI local bus
Graphics Card RAM/Max RAM	2Mb/4Mb	2Mb	2Mb/4Mb	2Mb/2Mb	1Mb/2Mb
Graphics Card					1024x768x256 @75Hz(1Mb)
Max non-interlaced resolution	1600x1200	1600x1200 @76Hz	1024x768x256 @76HZ	1280x1024x256 @75Hz	1280x1024x256 @75Hz(2Mb)
Monitor Manufacturer	CTX	Lite-on	Mitac	Sony	HP
Monitor Model	CM1565GM	D1528-LS	AL5064 EDM	Vivitron 1776 LE	D2806A
Monitor Size					
Monitor Maximum	15	15	15	17	15
Refresh Rate at 1024x768 (Hz)	84Hz	80Hz	75Hz	80Hz	75Hz
Free tech support lines	●	●	●	●	●
Fax support	●	●	●	●	
Company turnover (most recent figures available)	£39.5 million	\$3.5 billion	£41 million	\$2.7 billion	\$25 billion
Number of staff	125	7,500 worldwide	210	800+	99,900
					
KEY ● Yes ○ No * write-through with burst reads					

P E N T I U M 1 2 0 M H Z T A B L E O F F E A T U R E S						
	<div>Hi-Grade</div> <div></div>	<div>Olympian</div> <div></div>	<div>Panrix</div> <div></div>	<div>Simply Computers</div> <div></div>	<div>Viglen</div> <div></div>	<div>Western Systems</div> <div></div>
Manufacturer Model Name	Hi-Grade Computers PLC Winputer P120-M	Olympian Computer Systems Olympian Evolution 2000	Panrix Panrix Micron P120	Simply Computers Simply Pentium 120 Multimedia	Viglen Ultimate MultiMedia 120 PC	Western Systems Power Pro 120
Tel No	0181 591 9040	0181 880 4222	0113 244 4958	0181 523 4120	0181 758 7000	0181 842 0071
Fax No	0181 591 1586	0181 880 4222	0113 244 4962	0181 523 4002	0181 758 7080	0181 841 3891
Price (excl VAT)	2,370	£1,999	£2,350	£2,119	£2,144	£1,886
Processor Manufacturer and Model	Intel Pentium 120	Intel Pentium 120	Intel Pentium 120	Intel Pentium 120	Intel Pentium 120	Intel Pentium 120
Expansion Bus						
Local bus Architecture	PCI	PCI	PCI	PCI	PCI	PCI
Free local bus only slots	2	3	2	3	2	2
Free ISA only slots	2	2	3	3	3	3
Free shared local bus/ISA slots	0	1	1	0	1	1
Motherboard Manufacturers	TMC	TMC	Micronics	Super Micro	Intel	Elite
Chipset	Triton	Triton	Triton		Triton	Triton
No. of spare 3.5" bays	1	1	0	1	3	1
No. of spare 5.25" bays	1	2	2	1	2	0
Manufacturer	Seagate	Quantum	Quantum	Quantum	Quantum	Seagate
Size	1Gb	1.2Gb	1Gb	1Gb	1Gb	1Gb
Interface	EIDE	EIDE	EIDE	EIDE	EIDE	EIDE
Average access time (ms)	10	11	10	12	10	10
Main RAM	16Mb	16Mb	16Mb	16Mb	16Mb	16Mb
Max RAM	128Mb	128Mb	128Mb	128Mb	128Mb	128Mb
RAM Type	Standard	EDO	EDO	EDO	EDO	Standard
SIMM Type (pins)	72	72	72	72	72	72
Secondary cache (Kb)	256Kb	256Kb	256Kb	256Kb	256Kb	256Kb
Max secondary cache (Kb)	512Kb	512Kb	256Kb	256Kb	256Kb	256Kb
Cache type	Standard asynchronous	Pipeline Burst	Pipeline Sync	Pipeline Burst	Pipeline Burst	Writethrough
CD-ROM Manufacturer	Toshiba	Mitsumi	Sony	Pioneer	TEAC	Reveal
CD-ROM Model	5302B	FX-400	CDU76-E	DR-VA 124X	CD-56E	CDD4X
CD-ROM Speed	4X	4X	4X	4X	6X	4X
Sound Card Manufacturer	Creative Labs	Creative Labs	Creative Labs	Creative Labs	Creative Labs	Reveal
Sound Card Model	SoundBlaster AWE32	SoundBlaster AWE32	Vibra 16	SoundBlaster 16 Pro ADSP	SoundBlaster AWE32	SC500
Graphics Card Manufacturer	Diamond	Matrox	Matrox	Matrox	Diamond	VideoLogic
Graphics Card Model	Stealth 64 Video VRAM	Millennium WRAM	Millennium WRAM	Millennium WRAM	Stealth 64 Video VRAM	GraphixStar 300
Graphics Card RAM/Max RAM	2Mb/4Mb	2Mb/8Mb	2Mb/8Mb	2Mb/8Mb	2Mb/4Mb	2Mb
Graphics Card						
Max non-interlaced resolution	1280x1024x256 @ 72Hz	1600x1200x256 @ 72Hz	1024x786x256 @ 75Hz	1600x1200x256 @ 72Hz	1280x1024 @ 72Hz	1280x1024
Monitor Manufacturer	Panasonic	ADI	Iiyama	CTX	Viglen	CTX
Monitor Model	TX-1732B	4V	MF-15	1565 CD	Envy 15P	1565CD
Monitor Size						
Monitor Maximum	17	15	15	15	15	15
Refresh Rate at 1024x768 (Hz)	75Hz	70Hz	75Hz	75Hz	72Hz	80Hz
Free tech support lines	●	●	●	●	●	●
Fax support	○	●	●	●	○	●
Company turnover (most recent figures available)	£13 million	£1.5 million	£2.2 million	£34 million	£185 million	£30 million
Number of staff	55	14	14	140	240	160
						
KEY ● Yes ○ No						

Motherboards

Inside every PC is a large printed circuit board (PCB) called the motherboard. All the main components of a PC plug into it and communicate with each other through it. It is worth being familiar with a few basic terms to help you suss out how everything works and what you are getting for your money.

CPU (central processing unit)

Also known as the processor, this is the main chip — in this case a P120. It executes program instructions.

Chipset

A series of chips on the motherboard which handle the data going in and out of the CPU. All but one of the machines in this test used the Triton chip set, which Intel developed to optimise the performance of PCI bus. PCI (peripheral component interconnect) is a means of moving instructions and data around the motherboard. It is designed to improve the performance of peripherals, such as video cards, by putting them closer to the CPU.

RAM (random access memory)

This is the PC's primary storage area, used to write, store and retrieve information and program instructions which are then passed to the CPU for processing. For more on the operation of RAM, see the "Memory" section below. The type of RAM you have affects performance as the information stored here has to be refreshed many times per second by the processor.

D-RAM (dynamic RAM)

Has to be refreshed more frequently than SRAM (static RAM). Page-mode RAM is faster still, not needing to be refreshed so frequently and managing data retrieval more efficiently. EDO RAM is page-mode.

VRAM (video RAM)

Is designed specifically for video cards and allows the display to be refreshed and updated on separate ports, making it quicker than DRAM.

Cache

An intermediate storage capacity between the processor and the

RAM or disk drives. The most commonly used instructions are held here, allowing faster processing. The larger the cache, the more can be stored here, but the longer the access time. Write-through, asynchronous, synchronous and pipeline burst all refer to reading and writing instructions. Pipeline burst is the fastest of these and is quickly becoming standard in high-spec PCs.

VRM (voltage regulation module)

Used to absorb the voltage difference between the processor and the motherboard.

ZIF (zero insertion force)

A type of socket which allows the processor to be upgraded more easily. Socket 5 and Socket 7 are common types of ZIF sockets.

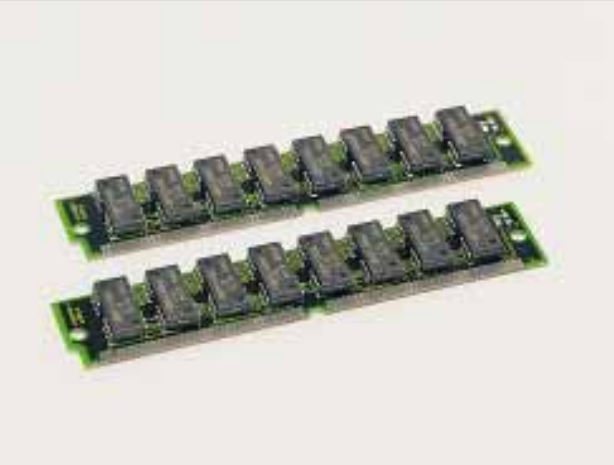


Memory

There are two types of memory which you need to be aware of when buying a PC. The first is the hard disk and the second is RAM.

The hard disk is the area where all the information on your PC is stored, including the system files your PC needs to operate, your applications and of course the data you input. This is permanent memory. When you close down the machine this data is stored and can be accessed next time you power up.

The larger the disk, the better the performance you can get out of it. This is due to the way it is made. Hard disks are made of a series of magnetic platters which spin. Heads read the data from the platters and transfer it to the RAM and so to the processor. The larger the hard disk, the more platters you have and the more heads to access the data, speeding up transfer rates as the other heads can search while



one is reading.

As applications grow ever larger, the need for a large hard disk becomes more pressing. If your hard disk becomes overcrowded it takes longer to search and becomes increasingly fragmented, so will not operate at its optimum rate. By buying a large disk now, you are prolonging the life of your machine by ensuring it will continue to operate well with future applications.

RAM is very different. It is an impermanent source of data, but is the main memory area accessed by the hard disk. It acts, if you like, as a staging post between the hard disk and the processor. The more data contained in

the RAM, the faster the processor can access that data and so the faster your machine will run.

Operating systems such as Windows 95 are extremely memory hungry and gobble up RAM. To run Windows 95 successfully, you will need a minimum of 8Mb, preferably 12Mb. To do justice to a processor as fast as a P120, you should really run with 16Mb.

CD-ROM drives and graphics cards

When Sony and Philips presented the original Red Book specification for digital audio on a CD in the early eighties, few would have believed how flexible the five inch shiny disc would become as a carrier of information.

A CD stores digital information which could be digitised audio, scanned photographs, digital video or plain computer data - files, applications and the like. Most CDs not containing pure audio or video are termed CD-ROMs (Read Only Memory) and you'll need a CD ROM drive to read them.

The first CD-ROM drives spun the disc at the same speed as a conventional audio player, delivering a sustained data transfer rate of around 150Kb/s, and known as single-speed. 150Kb/s is around the same speed as a floppy disk, and at least ten times slower than a typical hard drive; it wasn't long before the industry yearned for faster CD-ROM drives.

The first double-speed drive simply spun the disc at twice the speed, doubling the data transfer to 300Kb/s. Inevitably quad speed arrived which doubled again to 600Kb/s. Applications installed faster, files opened quicker, video clips played more smoothly and everyone was a lot happier. When an audio disc was inserted, the drives automatically dropped to single speed for compatibility.

CD-ROM drives have not only sped up, but dropped in price too. A typical quad speed costs between £100 and £150 and is an essential minimum starting speed for today's buyer. As important as speed is compatibility. All drives will play yellow book CD-ROM and red book audio discs, but only those labelled white book compatible will play Video CDs.

The future is speeding up, but not to eight speed quite yet. Six speed is already available, raising transfer rates to just under 1Mb per second. Six speeds will open conventional files very quickly, but early tests have shown that the decompression necessary to open a Photo CD image effectively slows down performance to quad speed.

Video cards

Video or graphics circuitry, usually fitted to a card but sometimes



found on the motherboard itself, is responsible for creating the picture your monitor displays.

Windows describes the desktop with its graphical device interface, GDI, commands. The software video driver takes the GDI information and converts it into a coloured bitmap image at the desired working resolution and number of colours.

This bitmap image is stored in dedicated video memory. The higher the resolution or the greater the number of colours, the more

memory you'll need. However, since it is a shared resource, reducing one will allow an increase of the other. 1Mb of video memory is capable of doing a resolution of 1024x768 pixels in 8-bit colour, offering 256 colours. Alternatively dropping to 800x600 pixel resolution will free up video memory to up to 16-bit colour, offering 65536 colours. All the PCs in this group test have 2Mb video memory, capable of 1024x768 pixels in 16-bit colour, 1280x1024 at 8-bit or 800x600 in 24-bit, just under 16.8 million colours.

Photographic images or smooth colour blends look best in 16 or 24-bit colour, the latter being described as true colour, or enough for you not to notice the steps. DTP and CAD applications work best at high resolutions, where fine details can be seen.

Video performance is dependent on several factors. One is the speed of the video memory. D-RAM is slower than the more expensive V-RAM. Speed of the bus is vital too, although the high performance of PCI featured on all these PCs at least eliminates this worry.

The video memory stores the desktop image as a digital bitmap, which must be converted into an analogue RGB signal for a monitor to display. A chip called a RAMDAC is responsible for the conversion. The speed at which this operates limits the maximum combination of resolution, number of colours and refresh rate.

At the same time, it's no good having an extremely high performance RAMDAC capable of ultra high resolutions at high flicker-free refresh rates if your monitor cannot lock onto the signal frequency. Try to get the most out of your monitor, but don't drive it too hard. All monitors in this group test should be able to display 1024x768 pixels in a flicker free, non-interlaced mode.

Gordon Laing

Sound cards

We asked each manufacturer to supply a WaveTable sound card with their systems for this group test. Most arrived at the office with a Creative Labs AWE-32, although some came fitted with older, FM-based Vibra 16s.

WaveTable sound cards differ from FM (Frequency Modulation) cards in that they store actual recordings, or a table of waveforms, of real instruments. WaveTable cards store instrument samples in ROM. The AWE-32 has 1Mb of samples on board; that's 128 melodic instruments and seven drum kits.

Because WaveTable plays back real instruments, as opposed to electronically generated sounds, they offer greater realism. Sound is further enhanced on the AWE-32 thanks to its on-board effects. These include several reverb types, chorus



effects and Qsound.

Qsound is similar to Surround Sound and fools the ear into thinking audio is coming from all around. Reverb can make the instruments sound as though they are being played in large concert halls, while Chorus gives the impression that more than one

instrument is playing.

Software bundled with the AWE-32 includes CakeWalk Apprentice, a 256-track MIDI sequencer, and several Windows applets enabling you to record, edit and playback MIDI and Wave files.

So is the AWE-32 any good? In many respects, yes — it allows user samples to be converted into MIDI instruments; it has lots of useful software; and the audio quality is more than good enough when used for games and multimedia applications.

Steven Helstrip



On the CUTTING EDGE

Welcome to Cutting Edge, the section in *Personal Computer World* that combines our regular reviews of games, books and CD-ROMs with features bringing you the latest news about computing, and consumer technologies and online services.

We now have the most comprehensive coverage of these topics available in a general computing magazine. Stay with us and we'll take the pain out of keeping on the cutting edge.

PCW Online

- 2 3 2 Focus** — Richard Vadon surveys the online gaming scene here and in the US. Is the virtual community of game players set to colonise the internet?
- 2 3 6 net.answers** — Finding your way round the internet throws up all sorts of queries: Nigel Whitfield has the solutions.
- 2 4 0 net.news (incorporating net.surf)** — CIX gets caught in the net, and the DTI launches its Schools Online project: news round-up by PJ Fisher.
- 2 4 5 net.newbies** — A short and simple explanation of how to get online.
- 2 4 6 Focus** — In the first of a series of three HTML features, Nigel Whitfield makes it easy for you to create your own web pages.

PCW Futures

- 2 5 3 Innovations** — Tim Frost on the turmoil surrounding the CD recorder market.
- 2 5 5 Horizons** — Simon Rockman on the innovation — or lack of it — in the world of RAM.
- 2 5 7 Bluesky** — Nick Beard continues his exploration of fault-tolerant software.
- 2 5 9 Retro Computing** — Simon Rockman on why the Jupiter Ace missed the mark.

PCW Media

- 2 6 0 Books** — *Start-Up*, the ups and downs of the Go Corporation, *The History of Computers*, and *Your Home Office*, reviewed by our panel.
- 2 6 8 CD-ROMs** — Test your encyclopedic knowledge with new discs from Microsoft and Grolier, plus Mel Gibson's *Braveheart* and the works of Robert Mapplethorpe. With Adele Dyer.



Focus:
Virtual Gaming

Kids' Stuff:
George Shrinks



Screenplay:
Phantasmagoria



CD-ROMs: Robert Mapplethorpe



PCW Fun

- 2 6 2 Competition** — Win a bumper bundle that includes notebook, monitor and SmartSuite 96.
- 2 6 5 Kids' Stuff** — A manic magician tested Paul Begg's reserve, plus there's news from the Best Toy Awards.
- 2 7 3 Screenplay** — The frightening *Phantasmagoria*, *Magic Carpet 2*, and joysticks judged.
- 2 7 6 Leisure Lines** — Puzzles with JJ Clessa.

Playing a net game

Is a virtual community of game players set to colonise the Internet? With an impending sense of Doom, Richard Vadon considers the online gaming scene in the US and the UK.

Online gaming could be the next big thing to hit the Internet. Research by US consultant Jupiter Communications predicts that online gaming will be a \$1.3 billion industry in the US by the year 2000.

In the UK, BT has announced Wireplay, its own online gaming service, showcased at Live 95. Beta testing starts in January 1996 and the service should be fully operational by the summer.

What's caused all this? Undoubtedly the arrival of Doom was a seminal event. It came from the Internet and changed the way people play and think about computer games. It was addictive enough when played against a computer but when you played it on a network against other people it was far, far better.

Online gaming provides something that games played alone on a home PC cannot; interaction with other people. Ironically, computers, which first released us from having to find other people to play games with, are now bringing people together to play games. So having destroyed your social life by playing computer games, you can now use your computer or console to make new friends online, and then try to kill them.

The games themselves are only part of what makes online gaming enjoyable. The players of online games become a virtual community. It is the interaction with other players, either in competition or in co-operation, that makes online games



Above 3D flight combat. *Fighter Wing* is distributed on the internet
Left Play ball on the AT&T Imagination Network



computer gamers. Online gamers tend to be older, smarter and richer — much more like Internet users than ordinary gamers.

so compelling.

Online gaming differs from ordinary computer gaming in that it is an inherently sociable activity — you play with other people. The American gaming networks report that players often just log on to hang around and chat. People even log on to watch other people play.

One consequence of this social aspect is that the demographics for online gamers are different from those for

BT's Wireplay is still in the pipeline, but in the US major players are already emerging. However, as you might expect in a young industry, no-one is clear how the market will develop or how best to deliver their services. Each of the US services (Catapult, VR1, ImagiNation and Simutronics) is taking a different route into the market.

Catapult is offering what amounts to a dating service for players of existing multi-player

console and PC games like Doom, Mortal Kombat and Streetfighter. Catapult's service connects two players, keeps track of their scores and allows them to send e-mail and chat messages to each other. PC users can already do most of this with direct modem-to-modem gaming. What makes Catapult stand out is the modems it has designed for consoles. These run at only 2.4 Kb/sec but allow full speed real-time gaming. The e-mail and chat services are so popular that Catapult now sells keyboards for the games consoles as well.

BT's Wireplay will take a similar approach to Catapult.

Gamers will be offered the opportunity to play the games they have on their own PCs against opponents connected by BT. Charges will be on a pay-as-you-play basis with no subscription fees. BT is negotiating with software developers to include the Wireplay access software within their games.

According to its publicity, Simutronics Corporation is dedicated to building huge online communities and having them destroyed by robots. It uses US online services such as America Online, Prodigy, and GENie to distribute its games. Simutronics games range from graphics-based arcade style shoot-em-ups to text-based adventures. Surprisingly, Gemstone III, a text based role-playing game, is three times as popular as any of the others and its players spend on average, \$85 per month.

VR1 has a similar strategy to Simutronics but uses the internet rather than commercial online services to distribute its games. Its first game is a rather splendid 3D flight simulation



Use your imagination on the net in widely varying situations; from sports simulations to fantasy role play

combat game called Fighter Wing which is currently beta-testing. However, the speed the game runs at depends on how direct your link to the Internet backbone is, rather than the speed of your modem.

The AT&T ImagiNation Network launched its direct dial service over a year ago. Users log on to ImagiNation computers to play a variety of multi-player games in a number of different virtual worlds. For instance, there are fantasy role-playing games in the medieval world and sports simulations in the arena world. Traditional games like

bridge are also available — indeed the US Bridge team prepares for tournaments on the network. ImagiNation finds that its customers spend a third of their time chatting or dealing with email.

The US online gaming industry likes to think of itself as being in the same position as the internet 18 months ago, and in some ways this is true. It's waiting for its killer application — the game that will really capture the imagination in the way that Sonic or Doom did.

How quickly online gaming grows is also dependent on the

costs of access and service. In the US local calls are free, so customers only have to pay for the service. Local calls are charged for in the UK and elsewhere in Europe, and this is likely to act as a barrier to the growth of online services.

The networks all use different methods to reach the market but would aim eventually to access the global market offered by the internet. But the internet is too slow and unwieldy at the moment — VR1 uses the internet but the connection in the UK never seems good enough to make arcade-style

Modem-to-modem gaming

Multi-player games, like Doom, which are played over a network, can also be played as modem-to-modem games using Compuserve or the Internet. Using Compuserve's MTM Gaming Lobby, members can play almost any modem-to-modem game with other members of the Compuserve Information Service.

A game can be scheduled in advance using Compuserve's Challenge Board (GO CHALLENGE) and Modem Games Forum (GO MODEMGAMES), or by just hanging around the Lobby.

To establish a connection for modem game play, players need to enter the Lobby by typing GO MTMLOBBY. Once there, they will find out who is there and what they want to play.

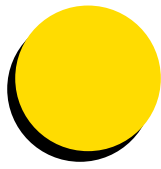
The /CHALLENGE command is used to initiate a game with another member. The syntax of the command requires two pieces of information: the player number of the opponent and the title of the game.

After the challenge has been accepted (/ACCEPT), both players

will receive confirmation messages. Once you receive this message, a "direct connection" is established between both players through Compuserve. At this point the game should be run.

When the game is loaded, each player will need to configure their game communications parameters. The game must be configured as a direct connection since both computers are already connected with one another. The game's baud rate and communications port settings should be set to the same as those used to access CompuServe.

The Internet can also be used to arrange modem-to-modem games. The Internet Modem Players Listing (<http://www.xmission.com/~morrison/IMPL/home.html>) is a mainly American resource but there are about 20 UK players listed. The drawbacks to using the Internet are the need to swap telephone numbers and the difficulty of splitting the cost.



game playing practical.

The games that do exist on the internet at the moment are limited by the constraints of the system: there is no animation or sound and long delays are experienced while pages load. Many games that are entertaining on a high-speed line are just not worth it with a more common 28.8 modem.

The best games on the internet side-step these disadvantages and make the best of the good points; its interactivity and sense of community. MUDs (Multi User Dungeons) are perhaps the best example of this because they come from text-based role-playing game tradition. MUDs are computer programs which users can log onto and explore. Each user takes control of a computerised character which can walk around, chat with other

Sprawl, for instance, found at <http://sensemedia.net/sprawl>.

MUDs came from the world of academia but the new generation of internet MUD games are being produced by corporate developers. Foremost among these is Delphi, part of Rupert Murdoch's media empire. Delphi's Camden Lock web-site contains four games: Phlong, a multi-player logic game; Ferret Frenzy, a racing game; Mornington Crescent (the nonsensical game derived from Radio 4 programme I'm Sorry I Haven't a Clue) and Netropolis, a corporate strategy game.

Netropolis is the newest and most advanced game. It is multi-player and has Sim-City style graphics. It's like corporate monopoly, with players as competing business tycoons. What really makes the game is the way competitors can affect

Games on the internet

- **Zarf's list of interactive games on the web** A best games list.
<http://www.cs.cmu.edu/afs/andrew/org/kgb/www/zarf/games.html>
- **Netropolis** Probably the most advanced game on the web, needs a lot of bandwidth.
<http://www.delphi.co.uk/netropolis/>
- **Lemonade** A simple, interactive, puzzle game but quite addictive.
<http://www.fn.net/~jmayans/lemonade/>
- **Virtual Vegas** As the name suggests a virtual casino complete with show girls, slot machines and a hot java version of poker.
<http://www.virtualvegas.com/playground.html>
- **Caissa's Web Chess** Allows you to play chess against anyone else who is currently connected.
<http://caissa.com>
- **ChessWeb** An open chess game; anyone can make a move.
<http://studwww.rug.ac.be/cgi-bin/cgiwrap?user=mjdbuyn&script=chess.cgi>
- **Sprawl** A good web introduction to MUDs.
<http://sensemedia.net/sprawl>
- **Ferret Frenzy** Delphi's rodent racing game.
<http://www.delphi.co.uk/delphi/interactive/ferrets/intro.html>
- **Phlong** Multi-player logic game from the Delphi stable.
http://www.delphi.co.uk/delphi/interactive/phlong/Phlong_title.html
- **Mornington Crescent** More a surreal joke than a game — but interesting.
<http://www.delphi.co.uk/cgi-bin/delphi/interactive/mcg/mcgames.pl>



Now, where has that giant got to?

characters, explore creature-infested areas, solve puzzles, and even create its own rooms, descriptions and items.

The best place to start is the Cardiff MUD page (<http://arachnid.cm.cf.ac.uk/User/Andrew.Wilson/MUDlist/>) which lists MUDs and related resources.

Beginners should try one of the Web MUDs such as The

each other. You lose if you go bankrupt, get caught playing too many dirty tricks on your opponents or don't participate for 96 hours (four years in Netropolis time).

The game has been a huge success, which inevitably means that the server has been overloaded. Gameplay over a 14.4Kb/sec modem can be tortuous but Delphi is looking

into making it more efficient by giving it its own graphical front end so that graphics do not need to be downloaded.

All Delphi's games are free. Chris Thomajan, Delphi Europe's Vice President, says that Delphi is currently looking at revenue models — which, roughly translated, means it hasn't quite worked out how to make money out of its games. Thomajan

believes Delphi's games work on the net because they have a "wicked spin" in keeping with the net's spirit. He hopes this spin is part of all Delphi's web projects as he feels most web sites are "way too bland".

Delphi's efforts are about as good as web gaming gets but as browsers advance so will the games. Already some games utilise Hot Java's capabilities, and more will do so as it becomes increasingly widespread. But as ever, software and hardware are closely connected. In the US everyone is waiting for the next generation of internet access hardware — the high-speed consumer cable modem. In the same way that each new Intel chip sparks a wave of software innovation, progress in modem technology will be followed by advances in browser software and online services.

net.answers



**Nigel Whitfield guides
you through the
internet.**

Q. I am a freeware/shareware programmer, and I have been on the internet for about a month and a half. As a relative newbie, I would like to know the best way to distribute my programs over the net, and then tell people where it is. Are ftp sites free? Is there any way to get a www site for free?

A. There are many different ways of distributing your software. The best way is to make them available by ftp, so that other people can download them whenever they want.

There are many ftp sites that hold large quantities of shareware and freeware, and they often have an "incoming" directory into which you can upload your files. Check to see if there's a file on the site that tells you how to submit uploads, as you'll often have to send email to a particular address when you've uploaded your file with a brief description. For instance, if you upload software to Demon Internet's ftp server, you should send a description to uploads@demon.net.

The best site to upload your software to will depend on what sort of program it is — remember to check and see whether or not shareware is welcome before uploading. You should also find out what right you're assumed to have been granted by uploading your software, because some sites publish CD-ROMs containing all the files on their server.

An alternative to uploading

files to a selection of different sites is to pay for your own ftp site, a service offered by some providers — though not many.

When you've uploaded files, a brief informational posting in relevant newsgroups is one of the best ways to bring attention to your programs, but remember not to make it into a blatant advert, or to post inappropriately. If you want to provide more information, it's a good idea to direct people to a web site, which can include links to the ftp server, so the file can be downloaded automatically.

Although there are some places (and it's a decreasing number) where you can have a home page without having to

pay anything, you usually won't be able to use it for anything commercial. But remember there are a lot of people who will host your web page for only a few pounds a month, and if a well-designed page makes it easier for people to register shareware, it could pay for itself.

Q. I've been offered a connection to the internet via a piece of software that uses something called UUCP. What is that, and what sort of connection will I get?

A. UUCP stands for Unix to Unix Copy Protocol, and as the name suggests, it was originally a method of transferring information between two computers

running the Unix operating system, though versions of UUCP are available for several different types of computer.

A connection to the internet via UUCP isn't as flexible as a direct connection. The internet itself uses TCP/IP, interactive connections which are used for things like accessing the world wide web, or contacting other computers by remote control.

UUCP is a batch system, which means that you have to create a list of requests which are then processed by the UUCP program. For instance, one request might be "copy this file to that computer," while another could be "copy this file to the other computer, and deliver it to X by email."

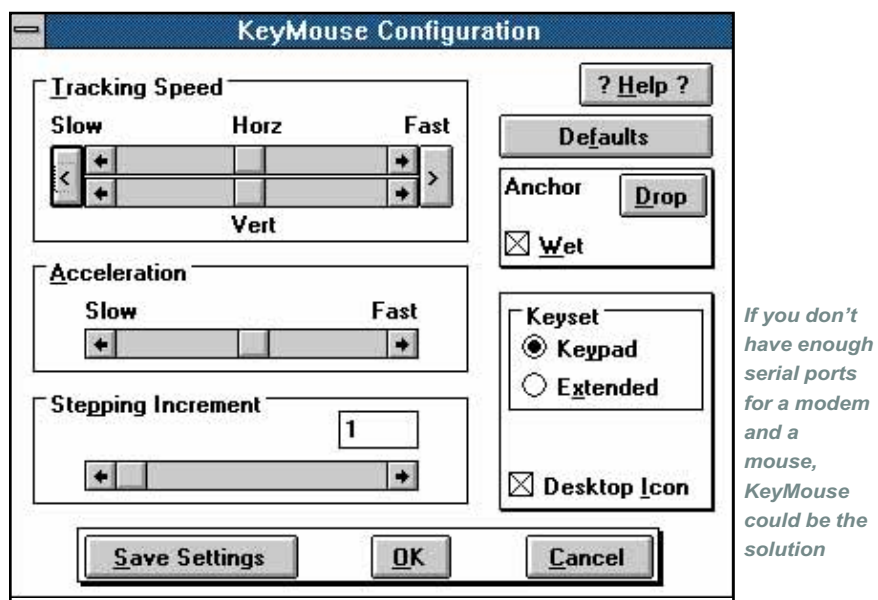
When your computer's UUCP program calls another, it sends all the files that you have waiting and then becomes the "slave", ready to receive any files waiting for you on the other computer.

In effect, the only thing that UUCP can do is copy a file from one place to another, and then run a program to do something to it. In practical terms, this means it's best suited to electronic mail, and other services that it controls. One example of a simple email service using UUCP is the IBM PC User Group's WinNet software. By sending email commands to special "ftp-mail" servers, it's possible to request any file that you could access via ftp on the internet.

But while you may be able to use UUCP to fetch files, or transfer mail and usenet news, you won't be able to use it for things like web access, IRC or telnet. In short, it's not designed for providing full internet access, and if anyone tells you otherwise, they're being economical with the truth.



PCW's site on the world wide web. It's surprisingly cheap to get your own site



Q. I use OS/2's WebExplorer to surf but it doesn't have hierarchical hot lists like NetScape. Is there a way I can do something similar?

A. Yes. In fact, you can arrange a type of hot list in almost any way you like using OS/2 Warp and versions of WebExplorer from 1.02 upwards.

Create folders on your desktop for storing your hotlist: for example, a "Warp links" folder or a "Fun stuff" folder. You can have folders nested, just like normal. To save the reference to a page, click on it with the right mouse button, anywhere that's not an image or a link, and drag the page into one of your URL folders. It will appear as a special URL icon, with a name matching the title of the current web page.

To view one of the saved URLs, drag it back into the WebExplorer window, or drop it on to the icon. Double clicking on a URL icon allows you to edit it. If you don't have the latest version of WebExplorer, you can download it from the internet, from the pub/WebExplorer directory on ftp.ibm.net.

Q. I want to create a newsgroup. How do I do it?

A. The smart answer is that if you have to ask, you don't need one. While there might have been a bit of truth in that adage in the past, it's not so much the case now — though in many cases there might already be a newsgroup covering the subject that you want to talk about.

First of all you need to ask yourself what sort of newsgroup you want. If it's a local newsgroup, you should ask the people who run your news server to create it. Within the

UK, proposals for new groups are discussed in the group uk.net.news.config, and calls for discussion are posted to uk.net.news.announce. If there's no opposition, there probably won't need to be a vote before your group can be created.

Groups in the "alt" hierarchy have to be discussed in the alt.config newsgroup, while those in the "biz" hierarchy (for commercial postings) are discussed in biz.config. The main set of newsgroups (those with names beginning comp, humanities, misc, news, rec, sci, soc, and talk) have a set procedure that involves posting calls for discussion and voting. Discussion takes place in newsgroups and to have a new group created, you'll need to win a two thirds majority in a vote, and have 100 more "yes" than "no" votes.

In fact, it's possible to create a group just by issuing the appropriate command, but most service providers won't honour the commands unless the group was proposed in the right place. It's important to follow the rules, and you should begin by reading the appropriate discussion group for a while before submitting your own proposal.

If you really want a newsgroup, there are two important things that you need to put in your proposal. The first is the name, and the second is the charter. The name should be easy for people to work out, and should fit in with other names. For instance, if you wanted to propose a group to discuss PCW, just picking the name "uk.pcw" is a bad choice: there's already a group called "uk.media.mags.net" to discuss internet magazines, so "uk.media.mags.pcw" would be a better choice. Remember, no part of

Making the connection

Q. How can I connect my Macintosh to the internet? All the books and articles seem to be designed for people using PCs.

A. Connecting your Mac up to a service provider is actually very straightforward — much simpler than using a PC. If you have System 7.5, you'll already have the most important piece of software: MacTCP. People with older Macs can either upgrade to the latest version of the system software or buy a book called *The Internet Starter Kit for Macintosh* by Adam Engst, which includes MacTCP on the free disk — it's worth buying the book anyway as it's an invaluable companion for Mac users.

The other important piece of software that you'll need is called MacPPP, which provides the link between your Mac and the internet, via a modem. There are two parts: the first is a driver that you select in the MacTCP control panel, just like selecting Ethernet or LocalTalk in the Network options on your Mac, and the second is called ConfigPPP which is used to fill in all the details of your internet service provider. The screenshot (below) shows the settings used for a connection to The Direct Connection, but it's very similar for other providers.

As well as a selection of other useful software, MacPPP is included on the disk that comes with Adam Engst's book, and it can also be downloaded from other online services, including the Macintosh conference on Cix.

Q. My company is thinking about connecting to the internet, but not for a while yet. We want to make sure that no one else can use the name for their email address. Can we register the name now, without connecting up?

A. Yes, you can. In fact, if you have a very distinctive name, it might be a good idea to register. *Don't* follow the example of some big US food companies that have registered virtually every product that they make as a domain name, like "margarine.com".

Depending on whether or not you want an international domain like .com (though many people will assume that you're American) or a UK name, ending in .co.uk, you'll have to register in a different way.

The InterNIC is the organisation in the US that looks after the top level domains,

and due to changes in the way that it's funded, you now have to pay an annual fee for each domain name that you register; an additional expense that you should bear in mind.

In the UK you will usually have to pay a service provider to register the name and keep their name servers up to date with information about your network. If you already have a connection to the internet, or are thinking of getting one, you should ask your service provider to arrange for registration of your name. If you're not connected, you should contact EUnet GB instead, who are in charge of the main database of UK domain information. EUnet charges a fee of £200 to register a name for you.

You'll also have to think hard about what name you want to give your company when you do connect, as the rules in the UK are quite strict, and you might not be able to have the name that seems most obvious to you.

As a general rule of thumb, your name shouldn't be too generic, and it should be longer than three letters. You'll only be allowed a short name if your company is universally known, such as the BBC. And if the name of your company is Celebrity Widgets Limited, don't try to fit it all into your internet domain, or people will quickly become tired of typing it all in.

More details about the naming process can be found on the world wide web, at <http://www.britain.eu.net/naming-co/> or by contacting EUnet GB, Wilson House, John Wilson Business Park, Whitstable, CT5 3QY, Kent, telephone 01227 266466.



Connecting your Macintosh to the internet is easy with MacPPP, and it's free with the Internet Starter Kit for Macintosh

the name of your group can be more than 14 letters long, so while "pc-world" would be a valid part of a name, "personal-computer-world" isn't.

After the name, the charter is the most important thing that you need to consider. It should say what the group is for, what topics can be discussed (and sometimes what can't) and whether or not the group will be moderated. A moderated group is one where someone has to read all the messages and decide which will be sent out, and this can be a lot of work.

Before you post a proposal for a new newsgroup, remember to do your homework and check to see if there are already groups or mailing lists that cover the topic — you might save yourself a lot of effort, or find plenty of people who are willing to help support your proposal. And most importantly, don't forget the golden rule — *always* read the guidelines to find out how to create a group before proposing one.

PCW Contacts

Nigel Whitfield is a freelance writer and maintainer of several internet mailing lists. He welcomes comments via the address nigel@stonewall.demon.co.uk; If you have questions you'd like answered, please send them to net.answers@stonewall.demon.co.uk.



net.news

PJ Fisher rounds up the online occurrences.

CIX finally joins the net

One of the most popular conferencing systems for the PC community has announced a full internet service. CIX is familiar to many PC users who have been using its conferencing system since the early eighties.

The introduction of the service was delayed by CIX due to scalability problems as it wanted to be sure that the system could withstand future growth and extra demand. CIX is now claiming performance levels three times those of rival services.

Matthew Sims, of CIX, said: "We have put a lot of money into the system at the start and are looking to the future so that we can expand easily. With 16,000 existing CIX subscribers, this was very

important." Sims claims that those users who have already sampled the service noticed significantly faster connections. CIX says that it caches a lot of popular web pages locally to help with access.

The server network has been custom designed to allow further servers to be slotted in as and when required, without upsetting the network.

Pricing for the new service starts at £15 per month with a one time set up fee of £10. Existing CIX users will be able to mix and match subscription time between the CIX Conferencing system and CIX internet, giving access to all the usual internet services such as the world wide web and Usenet.

CIX uses 28.8 modems and expects to have local call access for 80 percent of the UK. Support lines are currently open from 9.00am to midnight and will be upgraded to a 24-hour service. CIX members can sign up to the new service on the web at <http://www.compulink.co.uk/cix/cixip.html> or by phoning 0181 296 9666.



Delrina pack



Delrina has announced what it claims is the first integrated comms package for Windows 95. It includes a fax package, voice messaging and internet access.

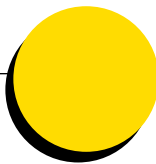
CommSuite 95 is aimed at the non-technical market, but also offers power features for more advanced users. Key aspects of the suite include CyberJack 7.0, an internet access, WinComm Pro 7.0, a general purpose comms software package and WinFax PRO 7.0 for sending faxes from the PC. A voice facility will be added in early 1996.

Delrina was recently acquired by Symantec, best known as suppliers of Norton Utilities and PC Anywhere.

SunSoft to offer Hot Java development tools

SunSoft, the software arm of Sun Microsystems, will offer a suite of development tools for Solaris or Windows platforms in early 1996. The kit will enable users to create web sites that take advantage of the Hot Java programming language. Hot Java promises to offer realtime video and interactive graphics on the web. Sunsoft claims this will be a complete web authoring and publishing environment.

Of real interest will be the WYSIWYG web editor. This will enable drag-and-drop editing of Web pages using Hot Java-based applets; mini programs that call up HotJava routines. The editor will be integrated with a dynamic browser for instant viewing of new page designs. And there will be a kit for distributing applets on the internet. The developers' kit is expected to be commercially available in 1996.



Novell's net vision

The immensely named Robert J Frankenberg, chairman and CEO of Novell, is determined that his company won't miss out on the networking revolution. Smart Global Network is a raft of ideas, alliances and new products which aims to enable any PC platform to work in a common networking environment, with NetWare forming a backbone.

An alliance with AT&T will bring AT&T NetWare Connect Services, designed as a public data network based on NetWare. It's claimed this will simplify connection to public networks and the internet within a secure environment.

Novell will also launch the NetWare world wide web server package in the first quarter of 1996. A new API, Net2000, will be released to develop the goal of internet access from any device, desktop or server platform.

Frankenberg believes that the Smart Global Network will be accessed not just from PCs but looks forward to a time when networks will be accessible from phones, cable TV, cars and even power lines.



Robert J Frankenberg

Schools Online

Perhaps stung by the Labour announcement at its annual conference, the DTI has launched its Schools Online project, aimed at encouraging schoolchildren to get net literate.

A joint venture between the DTI and 18 sponsoring companies, (including IBM, BT and Apple), the scheme is now piloting in 60 schools. A web server has been set up at the Anglia Polytechnic University.

Minister for Science and Technology, Ian Taylor, said that the scheme proved that the government was doing something about the internet. In response to the Labour announcement he said that "it was no good just putting a link into a school". He added that all schools already had a link to the Internet — "it's called the phone line".

A spokesperson for the project said that it had been designed to encourage participation and interaction rather than just passive web browsing.

Schools Online has been developed by the Ultralab at Anglia Polytechnic University. A dedicated server has been set up for the project which is connected to the SuperJanet backbone. The schools are mostly connected to the internet by 28.8 modems using local ISPs such as Cityscape.

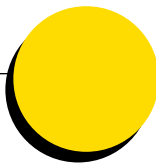
Schoolkids using the project are reported to be enthusiastic — some were designing pages of their own. The default web pages contain tips on html, advice on how to set up image maps, and CGI programming.

The Server site also contains a number of guidelines for the children about the dangers of replying to email from strangers, and the use of Netiquette.

To keep schoolkids away from internet porn and other undesirable newsgroups teachers are encouraged to use one of the number of barrier software packages such as SurfWatch now available. The Schools Online home page

can be accessed on http://sol.ultralab.anglia.ac.uk/pages/schools_online/.





CD-ROM uses www links

Two UK companies, Module Communications and Pow communications, have come up with an interactive CD-ROM with embedded links to the world wide web within the CD browser.

The hybrid CD-Net contains communications software that links to the internet when the CD is inserted into the PC. This then searches for updated information direct from a dedicated web server.

This presents a number of publishing opportunities. Potentially, it means CD-ROMs can potentially solve that eternal reference book problem — becoming out of date. Other potential users are retailers and shopping networks keen to offer a home shopping service based on the internet but worried about secure



transactions. Users could browse continually updated product lists and prices and buy products via a subscription number or store card.

As most of the graphics, sound and video files would be embedded on the master CD, the problems of slow downloads could be avoided. The web would simply be used to download up-to-date text information.

These two firms are not the first in the field however.

Another UK company, OmniMedia, recently demonstrated a CD-ROM music title that used similar web connections to download up-to-date tour information and trivia.

Shorts

Netscape takes on big boys

That's the view of industry watcher Forrester Research, which reckons that Netscape could outsmart Microsoft by turning the developer world upside down. The network will become the centre of the new world as programs will be "developed for, and delivered by, the internet". Forrester believes that a new trend towards corporate webs is developing (also known as the intranet) which could lead to "IT gurus reading the manual on html, instead of the one on Visual BASIC." The upshot of all this is that Netscape will be a threat to traditional corporate players such as Novell and Microsoft.

Bill's browser

Microsoft has released a Beta of Microsoft Explorer version 2.0, its proprietary web browser designed for Windows 95, based around Spyglass Mosaic. It ships with its own set of html extensions and can support realtime video and scrolling banners using AVI and background audio. However, none of these extensions will work with any other



kind of browser. Microsoft is on <http://www.microsoft.com>.

Server shenanigans

According to a Netcraft Web Server Survey, NCSA server software is the first choice of companies on the web. Of the 19,638 respondents to the survey, over 50 percent were using NCSA. Netscape and Apache however, were gaining sites with growth rates of over 20 percent per month each. Surprisingly Mac-based servers outnumbered NT servers. For more results go to <http://www.netcraft.co.uk/survey>.

Football shorts

● Both the Electronic Telegraph and the Daily Mail have hitched onto the footy

bandwagon with the launch of new internet sites for soccer fans.



The Daily Mail's Soccernet aims to keep fans up to date with results, tables and match reports from the Premier League. Soccernet is <http://www.soccernet.com>.

● The Electronic Telegraph has hitched up with its printed sister to promote Fantasy League Online. The rules are the same as the traditional version, but players get to choose the teams' strip and use hotlinks to profiles of star players. The game runs until May 1996 and can be found on <http://www.telegraph.co.uk>. Still no sign of a Nick Hornby



home page however. (Thank God)

More coffee?

London can now boast a grand total of two internet cafés with the opening of the imaginatively named Café Internet. Aiming to be more than just a room full of PCs and very little refreshment, the Cafe offers a licensed bar, function rooms and hot and cold food. Equipped with a raft of ICL Indianas, Café Internet is at 22/24 Buckingham Palace Road.



Inside at the Cafe Internet

Libel agreement

The recent libel case involving Prodigy and a New York broker firm Stratton Oakmont Inc. has seen some progress. Stratton Oakmont sued for libel after seeing a derogatory comments posted by a Prodigy user on one of its bulletin boards. In May the judge ruled in Stratton's favour, ruling that Prodigy was a publisher and liable for comments on its bulletin boards. The ruling sent shockwaves down the online services industry.

Now an out-of-court agreement between the two litigants could lead to a reversal of the judges original ruling. "The two sides are in agreement, this paves the way for the judge to reverse his judgment and then dismiss the case", said a Prodigy spokesperson.



net.surf

With all the publicity surrounding Sony's Playstation and the Sega Saturn, it's easy to forget that Atari has had a pretty good platform for some time in the shape of the Jaguar. Now it has launched an attractive web site called Jagwire for Jaguar fans. Get your claws into <http://www.atari.com>.



● Lottery fever has certainly gripped the nation, so no doubt the new InterLotto site will grab a few visits from wired gamblers. Based in Liechtenstein, Interlotto runs its lottery every week on the web with a guaranteed Jackpot of \$1 million. The downside? You need a credit card to enter (over the net) but at least you'll avoid the queue in the newsagents. Best of all there is absolutely no chance of seeing Anthea Turner. Roll your numbers at <http://www.interlotto.li>

● On the other hand if you are a fan of the "lovely" Anthea, you may care to check out her unofficial home page on <http://www.dur.ac.uk/~dcl0drt/anthea.html>. Like her brain, it is still under construction.

● Techies should check out Intel's excellent site which covers everything you could possibly want to know about Intel and Pentium processor technology. A wealth of information includes two online magazines for home computer users and advanced users. Be sure to try out the Pen-



tium Pro online 3d renderer, too, on <http://lanark.jf.intel.com/>.

Intel's home page is on <http://www.intel.com>.



● An excellent resource for PC, Mac and Amiga shareware has opened at the Virtual Software Library. This intelligently designed and researched site contains its own search engines and reviews of popular software. VSL is on <http://vsl.cnet.com/>.



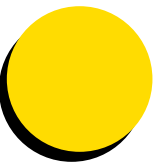
● According to the Clothes Show, skate shoes are the coolest things to wear on your feet these days. Something that skateboarders and surfers (the real kind) have known for a long time of course but everybody can now see the entire range of Vans shoes on their new web



site located at <http://www.directnet.com/Crash/Vans/>. You'll find an online catalogue of the entire range of Vans, a history of the company, as well as skate and snowboarding video clips. It's just a shame that most of the shoes aren't available in the UK.

● Special Compo

If the expression "surfing the net" makes you writhe with embarrassment, we want to hear from you. The proposers of the best alternatives to this awful phrase will be rewarded with a small prize. Email or post your entries to us here at PCW.



net.newbies

Getting started on the net



CUTTING EDGE

These pages are designed to be an easy-to-use reference guide to the internet for the novice — or “newbie”, as hardened netters will call you. Here’s an easy-reference guide to the tools which will help you make the most of the internet.

What is the internet?

The internet consists of millions of computers interconnected in a global network. The number of users is difficult to measure, but those worldwide who can at least exchange electronic mail messages is estimated to be 30 million and this appears to be doubling each year.

What is the world wide web?

It is not the internet. It is a service on the internet which uses special software (usually available free) to give users access to pages of information with pictures and multimedia instead of just text. About 15 million people around the world have access to the world wide web.

What do I need to get on?

A PC of almost any age can be connected to the internet as long as you can plug it into a modem. You don’t even need to be able to view graphics on your machine to look around (although it helps).

A modem allows your computer to dial in to another computer with a modem and communicate with it. They come in different speeds, from 2400 baud to more than ten times that. When you are using the internet, the speed at which things work is more likely to be

limited by the speed of your modem than by that of your computer. Buy the fastest you can afford. An old 2400 baud “V.22bis” model is fast enough to exchange electronic mail messages, but to send and receive files, or use the more exciting services on the internet, a modem which runs at a speed of at least 14,400 baud “V32.bis” is vital. Fortunately, these have plummeted in price over the past few years and now cost as little as £100. If you have the money, go for a 28,800 baud V.34 modem. Over time you’ll get back the added cost by reducing your phone bills.

Okay, I’ve got a modem. Now what?

For a modem to bring you information, it has to have a number to dial. This is where a “service provider” comes in — you have to subscribe to one if you want to get online. Whatever kind of connection you have set up, you will have to pay your phone costs on top of any subscription, unless you are lucky enough to get free local calls through a cable company. The bigger service providers will have the numbers you dial, PoPs (points of presence) scattered across the country so you only have to dial a local number.

If there’s no company near to your home which offers internet access, you may have to pay long-distance phone rates. Once connected, though, it doesn’t matter where the information you are accessing is physically located: you are always charged at the same rate. A list of providers and telephone num-

bers is available below. For more details, have a look at the supplement, banded with this issue of PCW.

Typically, a subscription that only provides electronic mail costs around £5 a month and Delphi offers this. But full internet access which allows you to use email and internet services for any amount of time, limited only by the size of your potential phone bill costs more, currently between £8.50 and £15 per month. There are dozens of companies offering this kind of Internet access; none of them big enough to dominate the market. The basic service being offered is largely the same, although some higher-priced providers may claim to offer a more personal service or a better selection of access software.

Online services: what do they offer?

Major online services like CompuServe or Delphi now offer Internet access and also have a large number of services of their own to which only their subscribers have access. These services include official technical support for hardware and software by electronic mail, online games, vast indexed software libraries and databases of business or consumer information. A monthly subscription tends to cost between £6 and £10 per month, plus a charge per hour if you are online for more than a set number of hours in that month. CompuServe is more expensive than the other internet providers, but you get what you pay for — it’s pretty foolproof.

Demon Internet is the best

known and most popular of the standard internet operators but doesn’t cater too well for absolute beginners. Perhaps better for the raw newbie is Easynet (although it only has Pops in London and Edinburgh) or UK Online. UK Online is a special case, a cross between an internet provider and an online service. For £8.50 to £12.75 per month it offers unlimited access to the internet, partially “censored” to make it safer for children to browse, plus access to online magazines and other services.

Although programs like Windows Terminal can be used to access these services, it is normally easier to use specially-written online software. Any service provider should provide you with at least some of this software when you sign up, and if you want to choose something different, most of it can be acquired online, free of charge.

PCW Contacts

CompuServe 0800 289378
email: 70006.101@csi.
compuserve.com
Delphi 0171 757 7080
email: uk@delphi.com
Demon 0181 371 1000
email: internet@demo.net
email: sales@thenet.co.uk
UK Online 01749 333333
email: sales@ukonline.co.uk
Easynet 0171 209 0990

If you don’t understand what’s written here or have any suggestions, please let us know. Contact **Paul_Fisher@pcw.ccmail.compuServe.com**, or “snailmail” (internet-speak for the post) to the address on page 12.

DIY Web pages

If you've surfed the Web, chances are you've seen at least a few pages that made you think: "I could do better than that." Nigel Whitfield takes the pain out of HyperTextMarkup Language.

For many people, the thought of anything to do with the internet seems technical and frightening — altogether much more like computer programming than it should be — but that needn't be the case with Web pages.

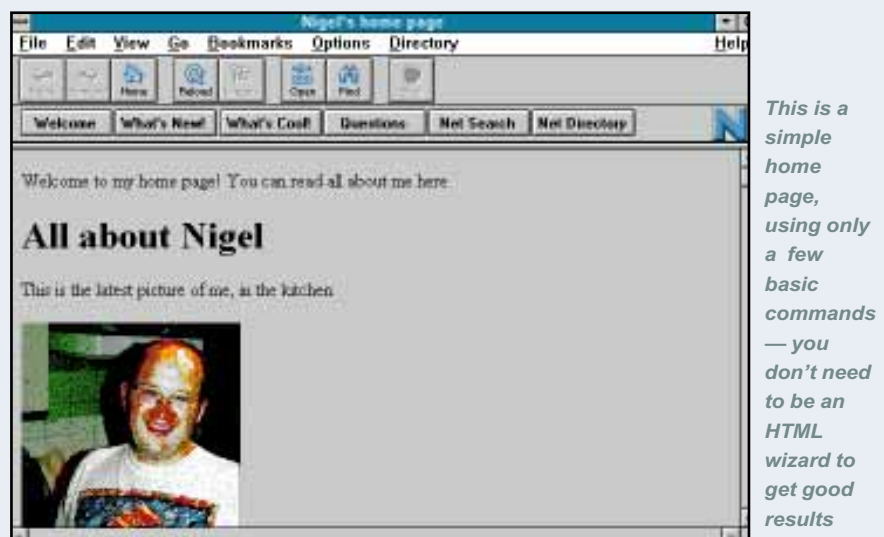
Over the next three months, we'll be looking at all the important aspects of writing your own Web pages, and by the time you've read this month's article, you'll be able to create simple pages.

Learning the lingo

Pages on the Web are written in a language called HTML — the HyperText Markup Language. Don't worry if the thought of a language sounds intimidating; HTML isn't really a programming language. If you've ever used the "tags" facility in a DTP program like Quark or Ventura, you'll be able to understand HTML easily.

An HTML document just consists of the text with tags that tell a browser how the text should appear on the screen, or to do specific things, like draw a horizontal line. To make a Web page, all you need to do is write the words and then add tags to say how you want them to appear — just like writing a page in your word processor and then selecting which lines are headings, or which words appear in bold.

There are now programs that make writing Web pages that simple, including add-



ons for WordPerfect and Microsoft Word, so all you'll have to do is point and click. So why spend three months learning how it works? There are a couple of reasons. First, not all the tools designed to help you write Web pages can do all the things that you might want to and second, you'll be able to write much better web pages if you understand what's really happening.

When you design your web pages, remember that you don't have complete control over how things will look. Unlike PostScript, HTML isn't a "page description

language" — it's a "markup" language. What this means is that, while a PostScript document might contain commands to print text in 24-point Times bold, you can't do that in HTML. Instead you can say: "this is a heading." If the person reading it has told their web browser to display headings in 24-point Times bold, that's what they'll see, but they could just as easily set it to anything else that they like. So, no matter how much effort you put into your pages, they could look very different when someone else looks at them later.

made easy

Playing tag

Let's have a look at a really simple web page, like the one shown in the screenshot. It's got all the important things that you might want to put on your own page, like a picture and text with different headings.

You can write a web page using almost any program that lets you save text files. In the second screen, we've used Notepad, which comes with Windows 3.1, and the text file is the HTML that produced the first screen. If you're using a Macintosh, you can use SimpleText instead.

There are two basic things to remember when you write an HTML document. The first is that almost all the tags come in pairs. For instance, if you want to give your page a title, you would write:

```
<title>Nigel's home page</title>
```

The second tag tells your web browser that it's reached the end of the title section; you can write the names of the tags in capitals, lower case or a mixture — it doesn't matter which. If you forget the end tag, then everything else in your document will be taken to be the title — if the results of your web page don't look right, check to make sure that you've remembered the end parts of your tags.

The second point to remember is that when a web browser reads your document, it automatically fits all the words to the width of the window, so if you want a new line in a particular place, you'll have to say so. There are special markers for things like new line and new paragraph, which don't have to appear in pairs; the new paragraph marker is <P>, which you can see in the screenshot at the end of each section of text.

A title and paragraphs aren't the only

things that you might want on your page; it would look pretty boring if that's all you included. The first way of breaking up your page is by putting in headings to divide all the sections. For instance, the line

```
<h1>All about Nigel</h1>
```

will create a heading in large bold type. The number after the "h" says how important the heading is; <h1> is the most important, and <h6> the least, so by choosing the appropriate level you can make it easy for people to find their way through your document.

Picture this

You can now put in text, with a title and headings. What about a picture? That's simple. Most web browsers let you include images on the page, as long as they're saved in GIF format. The line in the sample page that displays a picture of me is this:

```

```

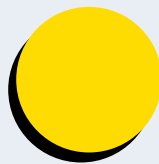
The "img" stands for image, and the next command, "src" says where the image is. If it's in a different directory, you can give the name inside the quotes as well, like

"images/nigel.gif" — make sure that the slashes point forwards, rather than backwards (like DOS or Windows).

The last part of the command isn't necessary, but it's good practice to put it in. "alt" stands for alternative, and the text inside the quotes will be displayed if your page is read by a web browser that doesn't display pictures. Many people turn off pictures to save time when they're web surfing, and they'll also see the text. If you don't use "alt" people will either see a bare icon or the word "IMAGE" which won't give them much idea of what's happening.

The final parts of our first page aren't needed by some older web browsers, but you should always put them in, as newer browsers may be fussier, and some won't even display your page without them.





To ensure that new browsers know your document is a web page, your file must start with the <html> tag, and end with </html>. All the tags for your page must be between these two, and are divided into two sections — the “head” and the “body”. The head is used to give information including the name of the page, and the body is the page itself. The simplest page you could write might look something like the box on the right.

Since web browsers format your page automatically, you don’t need to have spaces between tags — you could put the whole page on one long line — but it’s good practice to leave plenty of blank lines so that you can read the file easily.

Anchors away

Creating a web page with headings and pictures is all very well, but the most important feature of a page is links. Fortunately, you can easily insert a link by using “anchors.”

An anchor is a special type of tag that can do one of two things — it can tell the

Small but perfectly formed <html>

```
<head>
<title>This is a test page</title>
</head>
<body>

This is the text to appear on the
page

</body>
</html>
```

browser where to go when it’s clicked on, or it can be a marker that people can jump to from somewhere else.

The second type might not sound very useful, but if you have a long page it can be very handy — you could, for instance, put a miniature table of contents at the beginning so that people can go straight to a particular place in the document.

Each anchor that you create in this way has a name:

```
<a name="info">
Here's an anchor</a>
```

This anchor is called “info” and when someone jumps to it, the text between the tags will be at the top of their browser window — but it won’t be highlighted. Named anchors like this are invisible if you just read through the text.

The other type of anchor is a hypertext reference — it tells the web browser where to go when you click on it, and looks like this:

```
<a href="http://www.demon.co.uk/">
Click here</a>
```

The text in quotes is the URL (Uniform Resource Locator), and can point anywhere on the internet.

The actual link on the page for people to click on will be the text between the start and the end of the anchor tag — in this case the phrase “Click here.” If you just put the name of a file in the quotes, like “nigel2.htm” then the browser will read that file, which could be a movie clip, a sound or just another page.

You can put a reference anywhere in

Basic HTML tags

Here’s a quick summary of the tags mentioned in this month’s article, plus a couple of others that you might find useful:

Compulsory tags:

```
<html> ... </html>
<head> ... </head>
```

```
<body> ... </body>
<title> ... </title>
```

Other tags:

```
<a name="NAME"> ... </a>
<a href="#NAME"> ... </a>
<a href="path/filename"> ... </a>
<a href="URL"> ... </a>

```

```
<h1> ... </h1>
<h6> ... </h6>
```

```
<b> ... </b>
<i> ... </i>
```

```
<p>
<br>
<hr>
```

Put these around the whole of your document. These denote the heading of your document, which should include the title tags.

Put these tags around the main text of your page. The text between the tags will be the title for your page.

Create a named anchor called “NAME”

Create a link to the named anchor “NAME”

Create a link to “filename” in the directory “path”

Create a link to a specified URL

Insert the picture “picname”, or display the text “Words” instead

Put these tags around the text for a top level heading

Put these around the lowest level heading. You can use levels 2 to 5 as well.

Text between these tags will appear in bold type

These tags make text italic

End all your paragraphs with this tag

Force the browser to move to a new line

Draw a horizontal line across the page

Creating a page with images and links



◀ To start creating your document with Word, select File...New and then Html from the list of document types. If you don’t have Internet Assistant for Word, then you can grab it from ftp.microsoft.com. Remember that you’ll need Word 6.0a or later

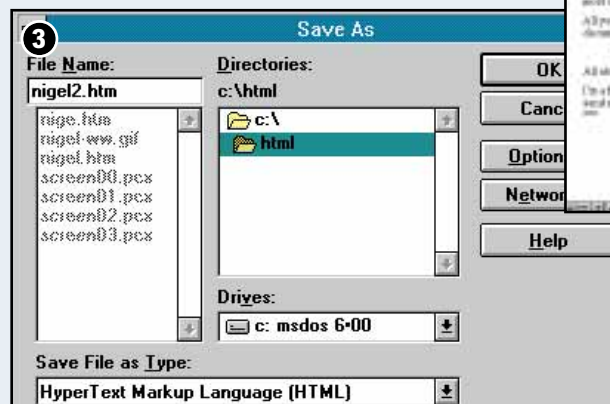


▲ To give your document a title, select HTML Document Info from the File menu and type it in. Most browsers will display the title, though it’s not seen in Word for Windows



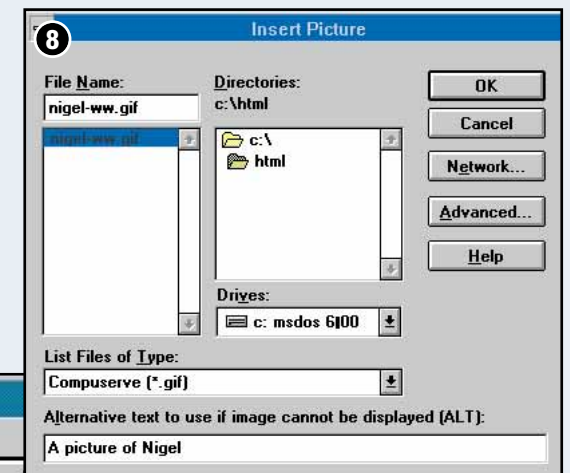
▲ This is the basic text of the document. You can type it in or just copy it from another document. If you want to add headings, just highlight the text and then select the heading you want from the drop-down style menu.

When you save the document, make sure you save it in HTML format — Word won’t remember for you

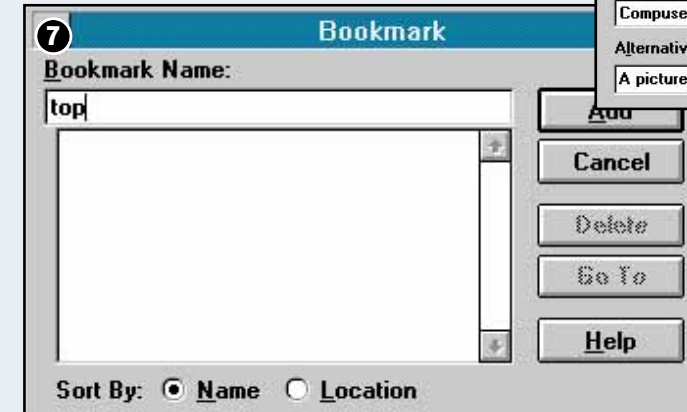


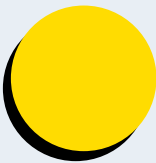
◀ To insert a link, click on the “chain” button. If you want a link to a URL, all you have to do is fill in the details in the space provided. A list of other links you’ve used appears at the bottom of the window so that you can select them easily

▼ To insert a picture, click on the icon in the button bar. You can specify the “alt” text in this dialogue box, for people who aren’t looking at the pictures



◀ If you want to insert a named anchor, click on the bookmark button and then type the name into the space and click the “Add” button





Handy Hints

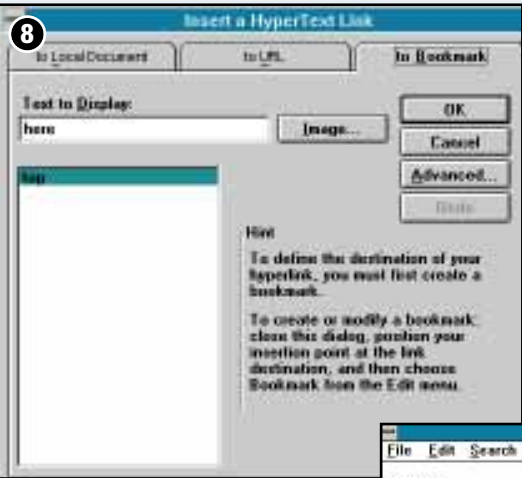
- Turning your words into HTML is the easy part of creating Web pages. Follow these hints to help save time designing your pages and make sure that they're easy for people to read.
- Work out what you want to do first. If you're going to have more than one page with links between them, draw a diagram so you can see which ones should be linked, otherwise you'll end up with a confusing maze of pages.
 - Make your first page short and simple. People don't want to have to wait ages to download a large home page. Have a quick summary and some links to other information on more pages.
 - Don't overdo the graphics. Pictures are very nice, but they take time and money to download. If you must have lots of them, make them small and make sure you use "alt" text for people who don't download the pictures.
 - Don't use too many headings. If you have lots, it'll be hard for people to read the text.
 - Try to avoid using special features that rely on people using a particular Web browser. They may not work at all if people use a different program to read your pages.
 - If you have a long document, break it up into sections and make a miniature index so that people can jump to anchors at useful points.
 - When you give the names of files in links or "img" tags, don't give the full path; just say where they are relative to the file that you're reading, so they'll still work if everything is moved to another drive or directory.
 - Always remember to use Unix-style forward slashes "/" in file paths, rather than DOS-style backslashes.
 - If you're using Netscape to view pages, you can drag your HTML file into the Netscape window to view it.
 - Save HTML files with the ".htm" extension on a Windows system, or with a name that ends in ".html" on a Macintosh — some Web browsers and servers prefer files to have names that end that way.

"nigel.htm#info" would go to the anchor called info on the page stored in the file nigel.htm.

Browsing

If all this sounds like hard work, don't worry. Once you've done a few pages you'll soon get used to it. And you can always do it the quick way, using an HTML editor. The walkthrough, starting on pages 248/249 shows how to create a page with images and links using the Internet Assistant for Microsoft Word for Windows 6.0a; there are similar add-ons available for WordPerfect, and most shareware web editors work in the same sort of way.

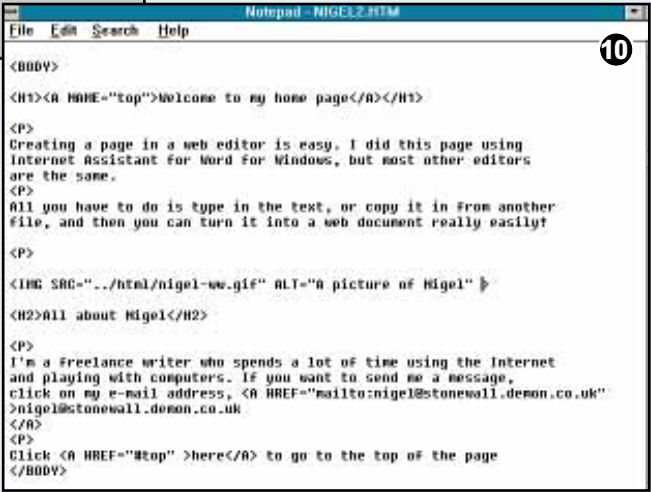
In next month's feature, we'll look at some of the more advanced things that you might want to include on your page. For now, you should know enough to create a basic page; don't forget to check out the handy hints box for a guide to creating pages that are easy to use and look at.



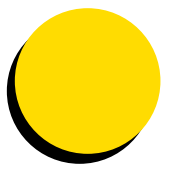
This is the finished result (with images turned off) using Word for Windows as the viewer. If you've made a mistake, you can click on a button to edit the page straight away



▲ When you want to jump to a bookmark, click to insert a link in the usual way and then select Bookmarks — you can pick the one you want from a list of all the ones in the current document



◀ This is the HTML that was generated automatically by Word. It's not complicated, but you can save a lot of time by using an HTML editor like Word or HoTMetaL



Innovations

Less haste, more speed

Tim Frost sees trouble ahead for the burgeoning CD recorder market as conflicting standards and copy protection systems begin to make life difficult for end users.

After a spectacularly slow start, recordable CD seems at last to be gaining momentum. Hewlett-Packard's announcement of its L850 CD writer package has already spurred other companies like Yamaha and JVC to reconsider their pricing, with everyone aiming at the sub-£1,000 point for their entry-level 2x speed recorders.

The domestic market is now getting its first real hi-fi versions. The Kenwood machine is now available in Germany — albeit at twice the CD-ROM pricing level — and a new Pioneer recorder is hitting most of the European markets.

These two machines demonstrate the effectiveness of the SCMS (Serial Copy Management System) copy protection system in appeasing the record industry. It has traditionally been very hostile to CD-R on the basis that with perfect copies, CD-R technology creates a pirate's charter.

SCMS started life in the DAT world. The digital data stream used to record the sound digitally from one machine to another includes SCMS data bits. A recorder fitted with SCMS circuitry will record the tracks once, but writes a flag

onto the tape so that further digital copies can't be made from it. This is a long-winded way of trying to stop successive copying from one taped copy to another — it won't, of course, stop anyone making lots of copies from the original CD.

The CD-R SCMS system goes one step further than this. The discs themselves have SCMS data recorded onto them. To ensure that all domestic CD-R recorders use domestic CD-R media, their SCMS circuit searches for the blank CD-Rs SCMS flag and if it doesn't see it, then it will refuse to go into record mode.

Exactly how this is intended to stop copies is an interesting question. Technically, domestic discs are the same as other CD-Rs, so the only way it can be a deterrent is if the domestic units are more expensive than those used for CD-ROM drives. But if the domestic audio versions are, say, twice the price of a CD-ROM version, anyone interested in CD-R will simply move to a PC-based type.

The second plank of the protection offered to the record industry is the Recorder Identification system (RID). The domestic recorder has its own

unique ID number which burns onto every disc on which it records so that disc can be tracked back to a particular recorder. But no CD pirate is likely to use hi-fi CD-R recorders to bootleg CDs when PC versions are so much cheaper. And, the record companies are unlikely to start prosecuting people for one-off copies, so it is difficult to see how RID is going to help. Except, that is, from making the record executives (whose grasp of anything remotely technical is tenuous at best) feel comfortable that CD-R is no longer in danger of wiping out their industry.

The fact remains that all is not well in the world of CD-Rs, and this is nothing to do with SCMS. Those early adopters, who have been working with CD-R for some time, have found that certain combinations of recorders and discs work but others are a disaster.

This difficult situation has been further aggravated by the introduction of 2x, 4x and 6x speed recorders. Combinations of disc, recorder and recording speed can produce wildly varying reliability rates. This has been discovered by CD audio and CD-ROM pressing plants

who receive CD-R masters, and check for error rates. Some perfectly respectable discs recorded on respectable CD-writers, from companies who know what they are doing, have thrown up error rates up to ten times higher than the worst level acceptable for replication.

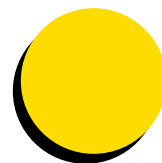
One initial problem has been that many of the first generation discs and recorders were produced before the Orange Book standard was finally completed, so they don't necessarily meet the latest specs.

The second, more important problem, is that when a CD-R blank is manufactured, it is designed with one particular recording speed in mind and will sometimes be more rigorously tested on one type of CD writer than another.

If you are using the right machine at the right speed there should be few problems; but change machine, or speed, and it might become impossible to produce a perfect disc.

As a general rule, working at 2x speed is most likely to produce reliable results. Although logic might suggest otherwise, single speed recording is not as effective.

An international committee is currently looking into the problem, and they will be producing guidelines to enable both disc and machine manufacturers to work towards a compatible world. In the meantime, if you are getting into CD-R and having problems, you may well cure them by using different media or simply changing the writing speed. ■



H o r i z o n s

La crème de la RAM

Do the RAM manufacturers really innovate, or do they follow each other like sheep? Simon Rockman looks at the new devices appearing on the desktop.

In the old days it was all so straightforward. You bought little chips which looked like robot spiders and plugged them into the sockets on the motherboard. All RAM was dynamic (DRAM), so all it needed was a little nudge of electricity to keep the transistors charged and store the data. A more expensive version, static RAM (or SRAM) used capacitors as well as transistors, and only needed to use power when it was accessed. Ideal for low-voltage applications, SRAM is both expensive to make and physically bulky, so it is not well suited to notebooks — which gobble megabytes.

When the processor accesses the DRAM, it needs to wait for the regular nudge, send a charge down the row and column wires and wait for everything to stabilise before reading back the value. It may be a wait of only a few nanoseconds, but when you need to do this for every single access, it slows down the whole system. SRAM, however, doesn't suffer such delays, making it roughly ten times the speed of DRAM.

The best type of RAM depends on the application. For example, programs tend to run around in circles, looping and

branching back to the same place, while video datum is stored in long continuous areas of memory. So a program needs lots of cache. This is the idea behind CD-RAM. Each chip has its own area of very fast memory — when the processor wants the next instruction it's ready and waiting.

Meanwhile, different video data is used for each frame and held in long strings, quickly outstripping the cache. This keeps the row voltage high and works along the columns. The result is half the access time and half the time waiting for lines to stabilise. The system is known as FPM, or fast page mode. Unfortunately the row voltage isn't held high for long enough, so special circuitry has to be added to the chip to allow more time to retrieve the data.

This is the technology behind EDO-RAM, or extended data out RAM. Waiting for memory slows down faster machines (over 33MHz) but EDO-RAM is good for those over 50MHz. With extra circuitry which fetches in advance of a data request, it is good for 66MHz. This may not be important now, but as the Pentium Pro (P6) starts to ship in faster versions (maybe up to 266MHz), and needs three

instructions per clock it will be necessary to feed the processor cache at a higher speed.

A trick beloved of video card manufacturers is VRAM, or Video RAM, which is dual-ported. The CPU is not always the only processor which needs to talk to memory; very often the data is written to RAM by the CPU, but read by the video display processor. What with the refresh, the wait states and the processor all accessing the RAM, the video processor is lucky to get a decent look-in.

A "back-door" to the chip allows the video processor to retrieve data while the processor is writing to it. As this is added to the other tricks, you could end up with RAM with enough processing power it could do a lot of the work for the CPU, a highly parallel machine in fact.

Over the last six months, Supercomputer manufacturer Cray Computers has been working on just such a system with a limited RISC processor capable of three operations on each RAM chip. RISC is nothing new, indeed it is based on a theory dating back to the fifties.

The problem with RAM innovation is that it is expensive. It needs enough manufacturers to take the plunge and buy faster

RAM — bringing the price of the new technology down. This has happened to some extent with EDO-RAM, because manufacturers feel it is fast enough, but without the expense of SRAM.

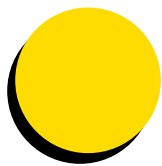
What is needed is a major computer manufacturer to commit to making millions of machines with a new technology, and a number of RAM manufacturers to commit themselves to making huge volumes of the stuff.

RAMBUS, or RDRAM is a coalition including Nintendo, chip manufacturers NEC, Hitachi, Samsung and OKI. RDRAM is synchronised to the bus clock, and will provide data on both edges of the signal — providing the extremely high bandwidth necessary for video games. Nintendo's new Ultra 64 platform, designed by Silicon Graphics, will have the video power of an Indigo workstation but will cost \$250. The 500Mbit/sec bandwidth makes it an ideal choice for Pentium Pro and P7 machines.

The RAM world may sound full of promise but in practice the commodity nature of RAM makes innovation unlikely. It will still be more effective to have large amounts of cheap RAM than a little of the fast sort.

At the moment specialist RAM is only found in video cards. However, as PC architecture evolves we will see the advent of the unified memory machine. The video system will share RAM with the processor, so if you need 16.7 million colours at 1,600x1,280 double-buffered, the system will take a couple of megabytes. If you only need 800x600 in 256 colours it will only need 512k and the rest of the RAM is left free to be used by the system.

Ironically, this is the way most small micros worked in the 1980s and is much more efficient. Sometimes the old ideas are the best. ■



Tolerance is a virtue

In the second part of his overview of fault tolerant software, Nick Beard looks at recovery blocks and N-version programming.

As we rely on software for increasingly sensitive areas of our lives, we have to be sure it will be reliable.

Software can never be 100 percent error-free: even the most diligently written packages are reckoned to contain a couple of errors per 20,000 lines of uncommented code. Although undesirable, it nevertheless represents the current limit on traditional fault avoidance techniques, and one must never forget that code remains — and will for the foreseeable future remain — a human resource. We have, of course, developed a number of fault-avoidance techniques to minimise the risks, including structured programming and reusable software modules.

But we need to look at new ways of creating fault tolerant software that will deliver expected, accurate results, even when it detects a failing in code. In other words; fault tolerant software. This may not be a problem when your word processor refuses to run its spellchecker, but when a nuclear power station goes down, as has happened in the past, it is slightly more worrying. This month we will take a closer look at the mechanisms through which software fault tolerance

can be implemented. This concerns software which assists in controlling hardware-implemented fault tolerance, such as hardware redundancy. The phrase also describes software where the overall system is able to continue to provide seamless delivery of services (as defined above) even where one piece of the overall software scheme proves faulty.

Studies of large computing systems such as big banking programs or airline systems show that “residual” software faults are a significant cause of system unavailability. Some of the components designed to manage hardware faults do a fine job of coping with occasional software failures. But they cannot always be relied upon to do so, and they tend to create additional systems complexity which is a source of error. So specific techniques to handle software faults were devised. Two of the main techniques are: recovery blocks and N-version programming.

The basic model for recovery block implementation is to produce a block of code which serves some specified functional purpose, and which shields the system environment from residual faults within the block. The blocks may be implemented

recursively, so each is embedded within “bigger” recovery blocks. Each retains a “recovery cache”, or other information store, so that in the event of a failure key system variables or other factors can be restored to the values they held before the error state occurred.

The basic syntax for recovery blocks is:

```
ensure (acceptance test)
by (primary alternate)
else by (alternate 2)
.
.
else by (alternate n)
else error
```

If the acceptance test is passed, the recovery block is exited, and the “recovery cache” can be purged. If not, an exception is raised and the initial system state recovered. Recovery blocks can be nested, so an error may lead to a “higher level” block thus being in an error state. Hence, it will either try alternates of its own, or will return an error message and go back to the data in its recovery cache. Recovery block techniques are well suited to object-orientated programming techniques.

An alternative approach is N-version programming, which is defined by one of its primary developers, Algirdas Avizienis of

UCLA, as follows:

“N-version programming is the independent generation of $N \geq 2$ functionally equivalent programs from the same initial specification. The N-programs all possess the necessary attributes for concurrent execution, during which comparison vectors (c-vectors) are generated by the program at certain points. The program state variables that are to be included in the c-vectors are specified in the initial specification.”

Avizienis wrote this definition in 1977, but the underlying notions can be traced back to Babbage. Writing about the work of calculators, or people who were employed to perform calculations, Babbage wrote in 1837: “When the formula to be computed is very complicated, it may be algebraically arranged for computation in two or more totally distinct ways, and two or more sets of cards may be made. If the same constants are now employed with each set, and if under these circumstances the results agree, we may be quite secure in the accuracy of all of them.”

This is remarkably similar to the self-checking software approach of the Airbus 320 flight control system, which is based on two separate program modules, each based on the parallel execution of two variants whose results are compared. There are thus four variants, which provide a tolerance to a fault in any of the four base modules.

PCW Resource Guide

Software Fault Tolerance

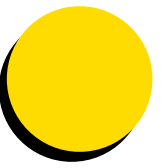
Michael R. Lyu; Wiley

An up-to-date survey of techniques for making software fault tolerant. From Wiley's *Trends in Software* series.

Fault Tolerant Computing Systems

M Dal Cin & W Hohl Springer Verlag

Proceedings of a conference dedicated to many aspects of fault tolerance, including hardware and software issue.



Retro

Go Forth and multiply

The makers of the Jupiter Ace relied on an eccentric language to speed up their Sinclair lookalike, but faith was not enough to send the machine flying into orbit. Simon Rockman looks back at Forth.

Twelve years ago the computer world was very different. Every new machine offered a Basic interpreter. Machines were judged by how quickly they could run a set of simple Basic tasks, so when a new computer appeared with Forth as its resident language, it created a stir.

The Jupiter Ace looked like a Sinclair ZX81, with a rubber keyboard like a Spectrum's and a cassette deck for storage. The similarities arose from the fact that the creators had left Sinclair to set up on their own. Their machine was based on the mistaken belief that Forth would make a good language for home users.

Forth was designed for controlling radio telescopes. It is a strange and quite entertaining computer language which relies upon a stack to hold the program. Instead of running a program from beginning to end you tell the computer what it needs to do. It then unpacks the routines from the end back to the beginning. For example, instead of saying PRINT 2+2 the Forth command would be 2 2 + . (the dot is the instruction to Print). The language is made up of around 140 key words, and



Jupiter Ace — the fastest micro computer in the universe 12 years ago?

fitted into the trivial amount of memory which computers had, 12 years ago.

This made the Jupiter Ace something of a Hot Rod. It was quick but not very good at actually doing anything. Mike Curtis, who looked at the machine in PCW

(January, 1983) clearly liked Forth but being something of a purist, he criticised the Ace for its deviation from the standards; which included a BBC Micro-like ability to include assembler in-line with programs.

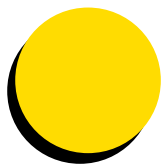
He didn't like the cheap finish, which for an £89 machine seems a little unreasonable, but the PCW conclusion was very accurate: "It does not have colour and with the price of

colour machines dropping fast this could be a big disadvantage. It has as yet no peripherals, though Sinclair ones can be adapted and Jupiter themselves are bringing out a parallel Centronics interface. There is no software around either, but hopefully this could change soon, especially if a large number of machines are sold; it could even bring about a boom in Forth software which could be run on a variety of machines."

That boom never happened and the Jupiter Ace was consigned to the curio category. It was only Forth which made it interesting, otherwise it was a simple machine; a Z80 processor running at 3.5MHz, 8K ROM, 3K RAM, a 40-key rubber keypad with no numeric keypad or function keys, a 1,500 baud cassette interface and modulated output through TV to give 32 x 24 characters. The character generator was soft-loaded so it could be programmed for a "high resolution" mode of 64 x 64.

Even in the days when a £90 computer was a sensible proposition, and being quirky had some advantages, the Jupiter Ace was never really a goer.





BOOKS

A behind the scenes account of electronic entrepreneurs, the essential source guide for computer shoppers and how to set up your own home office. PCW's book panel — Ben Tisdall, PJ Fisher and Dylan Armbrust — have Christmas all wrapped up.

Start-Up

Author: Jerry Kaplan
Publisher: Houghton Mifflin
Price: £15.99
ISBN: 0-395-71133-9
Pages: 322
Rating: ★★★★★

Start-Up is an account of the rise and fall of GO Corporation, the US startup that set out to launch pen computing. Six years and \$75 million later, GO corporation ceased trading. Jerry Kaplan's account of what happened in between makes fascinating reading, partly because the venture ultimately failed and particularly because Kaplan recorded GO's progress in great detail on tape and on paper. Kaplan, the brains behind the first PIM (Personal Information Manager) Lotus Agenda, describes the battle for venture capital, working to build the first prototype, and the protracted battle to obtain second round venture capital.

There are some priceless anecdotes. For example, in an early meeting between Kaplan and Apple Supremos John Sculley — then head of Apple — and Jean-Louis Gasse, president of Apple products, Gasse explained why Apple was doing so well: "Because we control the whole platform, both the hardware and the software. The rest of the PC manufacturers are going to the dogs, eating each other for lunch as they get squeezed by Microsoft on the software side and Intel on the hardware side." He gestured out

of the window to the world beyond Apple. "Would you believe they want us to license our software to others?"... "Windows is a joke...they'll never catch up."

Gasse was wrong about the PC manufacturers (just ask Compaq) and wrong about Windows. Ironically, he was also wrong about the desirability of controlling the whole platform. That was Apple's Achilles' Heel and proved to be GO corporation's too. As Kaplan says in Start-Up: "Creating an API is like trying to start a city on a tract of land that you own. First you try to persuade applications programmers to come and build their businesses on it...Once your city is established, owning the API is like being the king of the city." GO never did manage to get many programmers to develop for its operating system.

Even before GO had produced its first prototype, Kaplan arranged meetings with the heads of the big three software vendors, in those days Ashton Tate, Lotus and Microsoft. None of the big three ISVs were prepared to commit to developing software for the product and an internal memo from Bill Gates on the project is quite scathing in places: "Kaplan isn't the best CEO. They have some OK ideas but I don't think this thing will be big."

Early on, the founders of GO realised that the company was likely to be either a spectacular failure or a massive success. Ultimately, pen computing was

the flop of the decade but it was a seductive enough idea to persuade Microsoft to get involved on its own account (with Pen Windows) and for Apple to have a stab with the Newton personal organiser. In places, Kaplan's description of his endless flights around the States drumming up interest in his product get tedious, but in general it's a competently written and enthralling story of a phenomenon — the high-tech start-up — which barely exists in the UK.

deservingly won plaudits for their easy-to-understand but unpatronising style.

This new addition is no exception. The book takes you from the earliest developments in computing such as Jacquard's loom and Babbage's difference engine, right up to advances in GUI's and the arrival of the personal computer.

Key developments in technology as well as applications (in both senses) are duly listed. There is an excellent chapter on how World War II fuelled the development of the computer including, of course, the cracking of the Enigma code by Alan Turing and his associates at Bletchley Park.

The chapter on the first postwar mainframes could only be entitled "Heavy Metal Dinosaurs", and is accompanied by the usual pictures of room-filling machines with less processing power than a modern laptop.

The sixties and seventies ushered in the development of the microchip at Intel, the IBM Personal Computer and the Macintosh. Both machines get their own chapter and deservedly so as, current market share notwithstanding, there is no doubt that both revolutionised computing. As did a bespectacled gentleman from Seattle who of course gets his



The History Of Computers

Author: Les Freed
Publisher: Ziff Davis Press
Price: £22.99
ISBN: 1-56276-275-3
Pages: 153
Rating: ★★★★★

The History Of Computers is the latest in the Ziff-Davis "How" series. These popular books

story told too. And no matter how many times you've read this, it still makes you weep.

There are some omissions: there is no mention, for example, of the contribution that visionaries such as Douglas Engelbart or Alan Kay made to the development of the WIMP interface. A final chapter on the future concentrates on Digital Satellite Systems which is a little odd. And no mention of the internet. However this is a history not an oracle, and as such serves as an excellent general introduction to computing.

nity. Each section contains a mix of product reviews and topical essays or "info-boxes" that cover issues or ideas related to its section. The reviews are fair and balanced and not above pointing out a product's shortcomings. The Microsoft Encarta review in the Learning section is fairly critical. Knowing that every product won't get a glowing recommendation makes you value the ones that do.

The essays found throughout the book cover varying topics, and contain information that

most with an interest in computers would find appealing. Tips on how to avoid viruses; information on the developing "smart battery" and the comedic "Top Ten Signs You Bought a Bad Computer" are just a few of the offerings. I like this book because it does what it says; it provides quick and easy information. One minor drawback: the prices listed are in US

dollars. However, one should be able to do a simple currency conversion and factor in VAT to overcome this.

Your Home Office

Author: Patrice-Anne Rutledge
Publisher: Ziff-Davis Press
Price: £23.49
ISBN: 1-56276-327-X
Rating: ★★★★★

If you're contemplating working from home with your PC, you might want to have a quick browse through *Your Home Office*. It's a simple book that delves into the ever growing home office market. Patrice-Anne Rutledge talks about the growth of telecommuting and gives the reader helpful tips on the "how-to's" of setting up your own home office.

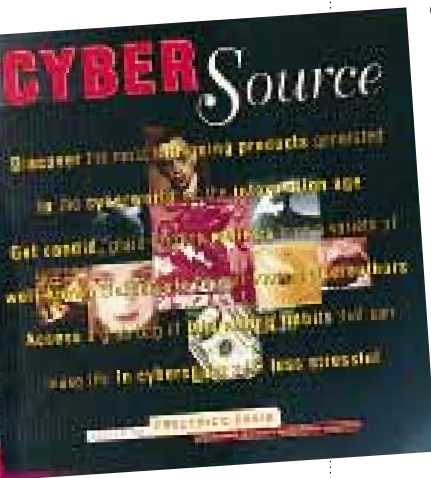
Rutledge discusses the growing trend towards telecommuting in the US and how industry



has begun to accept the idea as a way to reduce costs, increase employee productivity, and give its employees flexible work time. She begins the book by discussing whether or not telecommuting is for you. Some professions, such as writers or sales reps, are more obviously suited to home office work, but if you're not one of these it doesn't rule you out. She also provides a list of advantages and disadvantages to help the reader decide if they are a potential telecommuter. Rutledge takes a holistic approach to advice; headings such as "How to Avoid Isolation" or "How to Remain on the Fast Track" give you an idea of the tips she provides.

The bulk of the book, however, is devoted to the types of

hardware and software that one will need to set up a home office and where you can find them. It's helpful in that it tells you concrete specifications — you'll need a 486 or Pentium-based PC with a decent fax/modem — but fails abysmally for anyone living outside the USA. Almost all the contacts and services, especially the online services, are based in the US, have US contact numbers and are quoted in US dollars. This is incredibly frustrating for UK Joe wanting to move off to the High Street. It gives only general tips on how to become a telecommuter. But there is one distinct bonus to this buy; it comes with a CD-ROM containing helpful utilities and a nifty internal map of a computer. The verdict is: helpful, but far from indispensable.



Cybersource

Editor: Frederic E. Davis
Publisher: Ziff-Davis Press
Price: £18.49
ISBN: 1-56276-284-2
Rating: ★★★★★

Are you looking for a good, interactive multimedia program for your kids? What about a couple of different types of printers? Or maybe you're curious about database programs. Whatever kind of computer product you're looking for, *Cybersource* is the resource for you. It bills itself as "the definitive catalogue for a complete cyberexperience" and backs it up with loads of information.

It's not a complex book and it's got a sense of humour to boot. The book is divided into five sections: Learning, Real World, Fun, Self and Commu-

Top Ten Books: January 1996

1	Windows 95 Resource Kit	Microsoft	£46.99
2	Windows 95 Secrets	IDG Books	£38.99
3	Using Windows 95 Special Edition	Que	£32.99
4	About Face: Essentials of User Interface Design	IDG Books	£28.99
5	Delphi Developer's Guide	Sams	£46.95
6	Using Visual Basic 4 Special Edition	Que	£37.49
7	Visual Basic 4 How-To	Waite Group	£36.50
8	PhotoShop 3 Wow! Book	Peachpit	£32.95
9	Using HTML	Que	£37.49
10	Dynamics of Software Development	Microsoft	£22.95

List supplied by the PC BookShop, 11 & 12 Sicilian Avenue, London WC1A 2HQ. Tel: 0171 831 0022 Fax: 0171 831 0443

Win a bumper package

NEC Multispin 4X-IDE

NEC SuperScript 610plus

NIKON Scantouch AX-1200

A notebook, monitor, CD-ROM, laser printer, flatbed scanner and SmartSuite 96 — the winner takes all. And there are six runner-up prizes of Lotus SmartSuite 96, too.

For this month's competition prizes, NEC, Nikon and Lotus have showered us with goodies and one lucky reader can win it all. The winner will walk away with: a notebook, a monitor, a CD-ROM and a laser printer, all from NEC. There's a Nikon flatbed scanner, as well, and to top it all off, a copy of Lotus SmartSuite 96.

But so the rest of you don't feel left out, there are six more copies of Lotus SmartSuite to carry away.

NEC

The Versa 500 is NEC's new entry level notebook. With an upgradable DX4/75 chip, a 350Mb hard drive and 8Mb of RAM, and built-in flexibility in the form of two PC-card slots, the Versa 500 also has a DSTN (double super-twisted nematic) screen capable of 640 x 480 in 256 colours.

NEC's SuperScript 610plus is a GDI laser printer capable of virtual 600 x 600 dpi. It is ideal for the small business or home user with a 6ppm engine and SuperScript Level 2 software, to

allow you complete control over the printer via an on-screen manager.

For multimedia you could do a lot worse than the MultiSpin 4X-IDE. As you have doubtless already worked out, it is a quad-speed IDE drive. What you might not remember is that it won Editor's Choice in our last quad-speed CD-ROM drive round-up.

To complete the deal from NEC, is a MultiSync XV15 monitor. Capable of 1024 x 768 at 80Hz, it has a dot pitch of just 0.28mm. It is easy to set up

thanks to Plug and Play, and easy to adjust using a pop-up menu activated by a button on the monitor itself.

Nikon

To add real class to your office, Nikon is offering one of its ScanTouch AX-1200 colour flatbed scanners, complete with a transparency unit. The prize comes with Photoshop LE and OmniPage Direct so you can get straight on with playing around with your photos and OCR-ing your documents.

The scanner is a little gem,

with 24-bit full colour and an optical resolution of 565 x 1200 dpi, all at very acceptable speeds.

A 10-bit A/D conversion for each colour (RGB) with ColorSync compatibility gives accurate reproduction with fine colour gradations. It has TWAIN drivers and is SCSI-II compatible.

The transparency unit allows you to scan positive film directly. It uses a built-in fluorescent lamp and reflects the image back on to the CCD using mirrors.

Lotus

Lotus has given us seven copies of SmartSuite 96 (the new Windows 95 edition) with 32-bit versions of Word Pro, Freelance Graphics, Approach, the database, and SmartCentre, the suite command centre. Organizer, 1-2-3, and ScreenCam have been updated and made Win95 compatible.

SmartSuite can even get you on to the net via a choice of internet providers. Word Pro has HTML support and the CD-ROM version has an indexed database of Web sites in Approach.



NEC Versa 500

Answer these questions:

- 1) What does GDI stand for?
a) Graphical Device Interchange
b) Graphical Device Interface
c) Graphical Data Interface
- 2) Which three colours are referred to in the term RGB?
a) Red, green, blue
b) Rose, grey, beige
c) Ruby, ginger, brown
- 3) What is the SmartSuite word processor called?
a) WordPerfect
b) Word Pro
c) Word

Rules of entry

The competition is open to all readers of *Personal Computer World* except for employees, and their families, of VNU Business Publications, NEC, Lotus and Nikon. Entries to arrive by 19th January 1996. The Editor of PCW is the sole judge of the competition and his decision is final. No cash alternative is available in lieu of prizes.

PCW/Lotus/NEC/Nikon Competition

To enter the competition, just complete and post this coupon:

Name
Address
Postcode
Daytime Tel

Answers (circle a, b or c)

Q1) GDI: a b c
Q2) RGB: a b c
Q3) SmartSuite word processor: a b c

Send your completed coupon to: January Competition, Personal Computer World Editorial, VNU Business Publications, VNU House, 32-34 Broadwick Street, London W1A 2HG.

Kids' Stuff

This month Paul Begg and daughter Siobàn have news of awards, price cuts, and the family online. They also climb their family tree, look at some new interactive books, and investigate the arts of prestigid..., presidit..., pregidistit..., er, magic. It's been a busy month.

Prominent at the Best Toy Awards this year was Iona Software, who beat off stiff competition from the likes of Dorling Kindersley and Euromedia. They won the software category outright for Millie's Math House, a Gold Award for Thinkin' Things, and got two "Highly Commendeds" for Bailey's Book House and Sammy's Science House. We're embarrassed to admit that we haven't looked at any of these products here and we promise to rectify this next month.

Software designed to give parents some control over what their children can access on the internet is a growth software category that needs to be looked at later. In the meantime, if you saw the December issue of PCW you'll probably have tried out the free demo of UK Online provided on the cover CD-ROM.

Just in case you missed that issue or didn't bother to try it out, let me comment here that UK Online is an online service with full internet access. What makes it different is that it is specifically designed for the UK home market, especially for family users, and has children at the forefront of editorial policy — meaning that the material available online will be for a family audience and that parents will have parental control over the time kids are on the system and over what they can access.

Launched in the summer of 1995, UK Online is funded and



Left UK Online — an online service with the family firmly in mind

Below All About Me — A great educational program which, with a little forethought, can introduce children to writing, history and more besides

largely owned by Olivetti Telemedia, Italy (a wholly-owned subsidiary of multinational Olivetti), so that financial clout should ensure quality. Subscription pricing is £14.99 including VAT for four email accounts and unlimited access (including free internet access), which is certainly a persuasive price pitch. So, if you want your kids and yourself to benefit from online access, but want control, check out UK Online.

A few months ago I noted the excellent price restructuring of Microsoft's titles. Now the Corel Corporation has been equally aggressive about pricing, slashing its CD Home range of titles to a recommended retail price of £19.99. Almost all the CD Home titles are for children: the two that aren't are a reference title on Marilyn Monroe and the All-Movie Guide (a Cinemania rival),

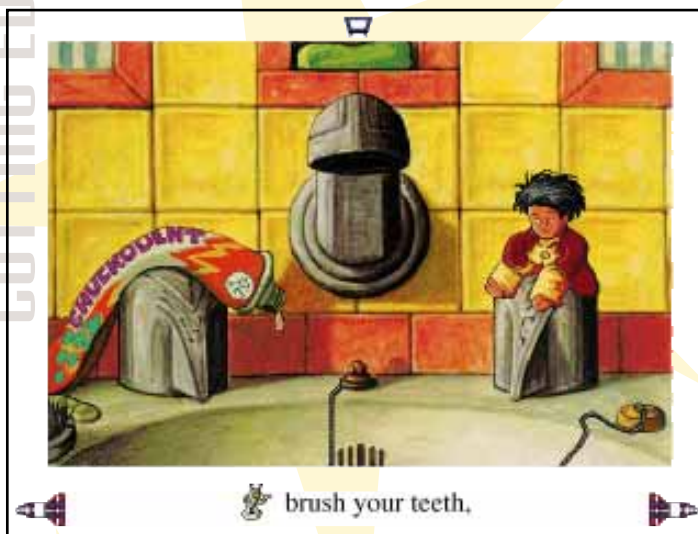


so the prospect of getting good quality and affordable software for kids in '96 looks better than ever before.

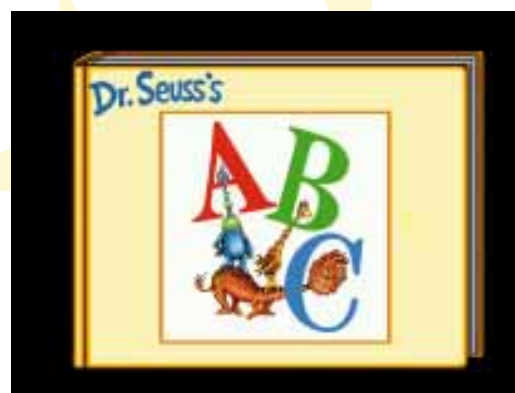
Easy Ball

And talking of Microsoft, the company has just introduced a trackball especially for children.

It's called EasyBall and is the result of extensive research into what young children want from an input device. Some of the research findings are all too familiar — that a mouse is hard to use and ties you to an uncomfortable desk. EasyBall is large (for holding in the lap), has a big

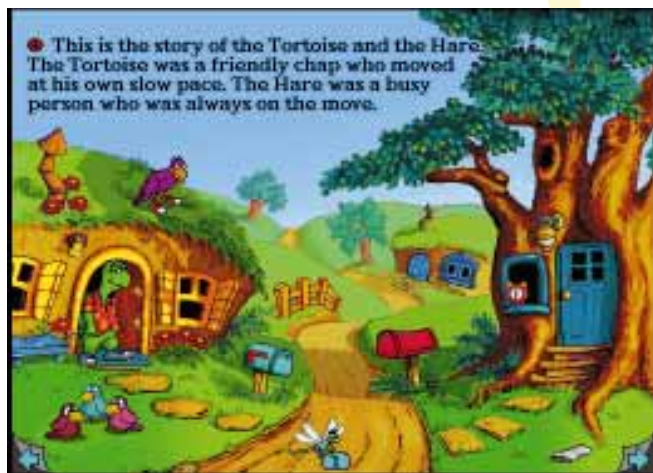


Left *George Shrinks* — A charming and witty story accompanied by great illustrations, but not enough interactivity



Left *The latest from Broderbund Living Books*

Below *Tortoise and the Hare* — now anglicised



yellow ball and a blue button with an audible click when you press it. Best of all, there's a dual-input driver which lets parents use their own mouse or trackball simultaneously. Easy-Ball comes with some tasty software, too: Pointerland, an interactive farm scene to teach pointing and clicking, and Explorapedia (which has been

localised for the UK market.

All About Me

An unusual software package we looked at this month was All About Me from Harper-Collins Interactive. Designed for children aged from six upwards (I reckon it's probably too babyish to survive much beyond 11), it's an introduction to family his-

tory and genealogy. Tracing one's family history is one of the fastest growing hobbies in Britain and a great way to combine the computer with family days out. This is because the best way of building a family history is to talk to parents, grandparents and (if you're lucky) great-grandparents, recording their memories of childhood. Later on you can take the children to visit the remembered places, such as grandad's old school or first workplace. You can even take your research further, introducing children and maybe even yourself, to the Local History Library and other places.

The Main Menu gives you four options: Calendar, Storymaker, Family Tree, and Card Maker. The Calendar is a place where you can enter special events such as birthdays and anniversaries. Family Tree is where you can build a record of your own family. It doesn't go beyond great-grandparents and it isn't very flexible (you must enter a birthdate before the program will let you enter a name, but, of course, a birthday is something you might not know), but nevertheless, it's a good starting place. The Storymaker is where you can write a story about your family. There are four ways of doing this, each with a few tips or guides to the questions to ask. With Make A Card you can create your own greeting cards.

Overall there's a lot here. The manual is well-written and the program is designed to stimulate a young mind. With a little parental help, it could be a great way to give children a sense of

their own place in the family and to introduce them to wider historical interests. It comes on four floppy disks, by the way.

Interactive books

Also from Harper-Collins Interactive come two interactive books: *George Shrinks*, and *If You Give A Mouse a Cookie*. They follow the established pattern of letting you read the story or having it read to you and there are the usual hidden animations when you click parts of the screen. Neither disk enjoys as full a compliment of click-on surprises that distinguish the Living Books series, although they both contain good original music and songs. The illustrations in *George Shrinks* are wonderful, whether you're young or old, you'll love this CD-ROM.

Childrens' Classics

While we're on the subject of Living Books, two new titles reached me this month. The first is *Dr Seuss's ABC*. Theodore Seuss Geisel, born in Massachusetts in 1904, wrote childrens' books during the thirties and achieved huge popularity in the US but up till now never achieved wide recognition in the UK. This CD-ROM may change that. It has original music, sound effects, Dr. Seuss's well-loved characters and much besides to keep young children aged from three to seven years old entertained while being introduced to the letters of the alphabet.

The second title is Aesop's fable; *The Tortoise and the Hare*. It enjoys the same high standard and differs little in presentation from other Living Books titles, but there is one huge difference: this is a completely Anglicised version specially for UK audiences. Living Books has taken care to make its software nation specific; a more involved process than you'd think. The translation has to be spot on, the voice actors have to correctly time and deliver the jokes, and even the screen images some-



Above *There's a lot wrong with this disk but I liked it.*

Right *Learn the Art of Magic with Jay Alexander — Kid's will love it, but you could easily grow to want to kill Jay Alexander!*

times have to be changed to accommodate the language.

Magic

At a dinner party a few weeks ago, after we'd all eaten a wonderful meal, we took our coffee into the living room and the children entertained us with a little drama called The Victorian Classroom. It struck me then that no matter how sophisticated children are these days, they still love the old dressing-up box and putting on a show for family and friends, usually with an attempt at magic.

It struck me that interactive CD-ROM was well suited to teaching a few simple magic tricks. Learning a trick involves watching it repeated over and over again, which is something that multimedia lets you do so easily. But until recently there were no "magic" CD-ROMS. Then, like buses, two came along at the same time.

Learn the Art of Magic with Jay Alexander has the better pedigree of the two, as it comes from Broderbund, of Living Books. At first glance it looks a real winner. It comes with several magic tricks in the box and



full instructions about how to perform the magic are given on the CD.

The CD graphics are excellent: Jay Alexander could have stepped out of Monty Python, and the presentation is madcap enough to keep a kid entertained and drive a parent round the bend. Altogether, Jay Alexander demonstrates and teaches 26 magic tricks in five categories called Crazy Card Tricks, Radical Rope Tricks, Groovy Table Tricks, Magic Set and Money, Money, Money. Then there's the Magic Language (the patois of the prestidigitator, as it were) and The Oath — the secret every magician must know and uphold. There's also Box Office, a printing utility which allows kids to print their posters, tickets, and even fake their own magician's certificate.

Secrets of Magic with Dikki Ellis lacks all the Pythonesque madness, the poster printing

module, and the props of Learning the Art of Magic, but it does come with a VHS video — which is actually the origin of this CD-ROM. The only real benefit of having the CD-ROM is the ability to review tricks over and over until you get them right. And you'll want to practice some of these tricks because they are simple but good — such as how to flick a silk scarf onto a table three times and produce a knot in one end. Or, how about asking

somebody in your audience to examine and then divide a pack of playing cards into two piles, wrap each pile in a rubber band, then choose a card (not showing it to the magician). The member of the audience then places the chosen card between the two piles. You murmur the magic words, separate the two piles and the chosen card has vanished. If this doesn't have Granny sitting on the edge of her seat, you then drop the cards on a table top and out from the pack shoots the chosen card. Simple but impressive. There's a good but brief history of magic, with a few illustrations and an Encyclopedia of magic tricks you can perform sitting and standing. These tricks are accompanied by line drawings demonstrating how the trick is done.

Of the two, I preferred Secrets of Magic with Dikki Ellis, mainly because the frenetically zany Jay Alexander got on my

nerves — remember, Jay Alexander may get a smile one time, but by the 20th re-run you'll cheerfully throttle him. Being perverse, kids will probably prefer Jay Alexander, especially with those magic props.

Which just about wraps it up for this month, and this year. To kick off 1996, we'll take a look at some of the titles we overlooked in 1995 as well as some exciting new ones.

PCW Details

All About Me

Price £29.99

Contact HarperCollins Interactive

Tel 0181 307 4158

Fax 0181 307 4158

Rating ★★★★★☆

George Shrinks.

If You Give A Mouse A Cookie

Price £39.99

Contact HarperCollins Interactive

Tel 0181 307 4158

Fax 0181 307 4158

Rating ★★★☆☆

Dr. Seuss's ABC

Price £30.00 (inc VAT)

Contact Broderbund

Tel 01753 620909

Fax 01753 621404

Rating ★★★☆☆

Tortoise and the Hare

Price £30.00 (inc VAT)

Contact Broderbund

Tel 01753 620909

Fax 01753 621404

Rating: ★★★★★☆

Learn the Art of Magic

with Jay Alexander

Price £30.00 (inc VAT)

Contact Broderbund

Tel 01753 620909

Fax 01753 621404

Rating: ★★★☆☆

Secrets of Magic with

Dikki Ellis

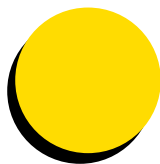
Price £39.95 (inc VAT)

Contact FastTrak Software Publishing

Tel 01923 495496

Fax 01923 228796

Rating ★★★☆☆



CD-ROMs

Scroll through new encyclopedias from Microsoft and Grolier, and cruise Robert Mapplethorpe's world of stylised homoerotica with this month's CD-ROMs. Quizmaster **Adele Dyer** will be testing you later — don't forget the **Battle of Bannockburn**.



Encarta 96 Encyclopedia, and The 1996 Grolier Multimedia Encyclopedia

The new encyclopedias have hit the shops again in time for Christmas and Microsoft and Grolier have unveiled their latest offerings — rejigged, updated and in the case of Encarta, localised for the UK.

Encarta and Grolier both take very much the same approach to their subjects. Both offer search facilities through a list of article: and broad categories such as the world (maps), a timeline, a multimedia section (i.e. the collected photos, movies, audio clips, animations, and charts) and discovery sections.

Grolier and Microsoft have built internet capabilities into their products. Grolier has included hyperlinks to Compuserve, and Microsoft lets you download and integrate updates via MSN or through the Microsoft web pages.

As you can imagine, both are

extremely thorough in their approach. Encarta boasts 27,000 articles to Grolier's 34,000. However, the proof of the pudding is in the contents and this is where Microsoft just steals the edge on Grolier, by a hair's breadth.

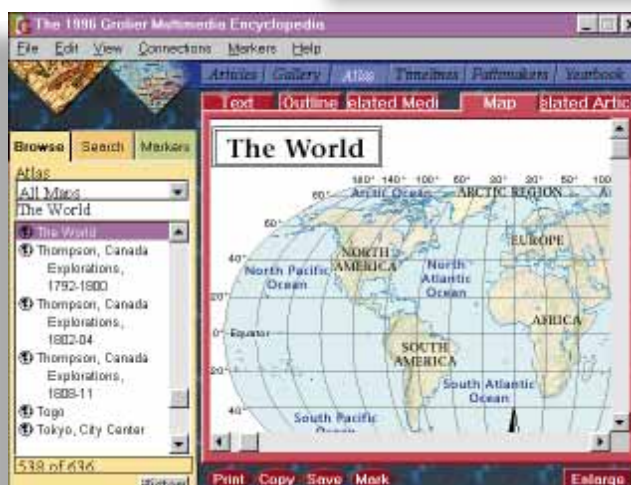
I used my own pet subject — French Literature — as the acid test, and although Grolier mentioned just as many of the important authors and movements, the Microsoft version was slightly more accessible and comprehensive.

On the other hand, Grolier's maps were far better. A cynic might say that this is because Grolier has not got an atlas product coming out soon, whereas Microsoft has.

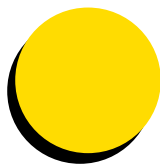
The main area where the two products differ, however, is in localisation. Microsoft has employed a team of content specialists to tailor the product for the UK and Europe. But since there are no adaptations for the

other European countries, or for the Antipodes, these markets will have to choose either the US or the UK version.

The new UK slant has involved a lot of updating and writing of new material — the entire encyclopedia has been revised to eradicate Americanisms. The advantage with this is that you avoid such annoyances



Encarta (above) and Grolier (left), both provide multimedia maps. Encarta's localised detail and general polish give it the edge



as having to look up aubergine only to find that it's not there (the Grolier classes aubergine as eggplant).

There is also a lot of local information, which makes it more relevant to a British user. For example the history and arts sections respectively cover the Tolpuddle martyrs and Sir Ian McKellan — neither of which are in Grolier.

Localisation is not regarded as important by Grolier, but it *does* make a difference to a British user. It will be interesting to see whether Grolier 97 adopts the technique.

Localisation played a major part in my preference for the Microsoft, but it has to be said that this is generally a much slicker product. The interface on the Grolier is positively clunky compared to Microsoft's clean lines. In Encarta, the tours through the areas of interest are highly enjoyable, while the Grolier version, by comparison, seems to have been put together sloppily.

In terms of general content and ease of use there is little to choose between them. It's style that tips the balance, and Encarta wins this hands down.

Encarta 96 Encyclopedia

Contact Microsoft

0345 002000

Price £49.99

Rating ●●●●○

The 1996 Grolier Multimedia Encyclopedia

Contact MHM

0181 600 6023

Price £44.99

Rating ●●●○●



Braveheart

Proof positive that media moguls are getting interested in CD-ROM comes in the form of this offering from Icon Productions. As this is Mel Gibson's own production company, allied to Paramount and ViaCom, the CD could be viewed cynically as yet another piece of marketing to go with the posters and T-shirts.

However, the CD is much too good to be dismissed as just another marketing tool. It contains a lot of information about the background to the film, but can also stand on its own as an introduction to the historical period.

There is plenty of detail about the political situation, and how people of the time lived, fought and rebelled. The CD is designed as an educational tool for schools as much as to sell the film, and as the former it succeeds very well. The central figures of the time, including William Wallace, Robert the Bruce and Edward I are all discussed, as are means of warfare, the role of women, and agriculture and music.

The section on the film itself is a bonus to those who have seen it, but is otherwise not that important. It is more like a multimedia version of the sleeve notes you used to get on 12in vinyl records (remember them?).

There are 16 short scenes from the film itself, as well as interviews with the production team and cast, hints on how the film was shot and full CVs for all the actors. However, this does not take up too much of the disk, and is an additional section rather than the main event.

I must admit my status as a closet Mel Gibson groupie makes me biased. But this CD will be appreciated even by those not interested in the worship of a tall, dark handsome star. The educational sections are excellent and if it is a marketing scam, then I've been well and truly scammed.

Braveheart

Contact Koch Media 01252 714340

Price £34.99

Rating ●●●●○



*Not just a pretty face:
Braveheart provides a good
overview of a
certain place and a time*



Robert Mapplethorpe — an Overview

This is one of the first CD-ROMs to come out of New Media Solu-

tions and. More importantly, it's also the first to be compiled using ImageAXS, a graphics database package also marketed by New Media Solutions, which was reviewed in the December issue of PCW.

As an image database, this CD-ROM takes a slightly different shape to many of the art CDs we have seen over the past year or so. The usual information on the artist and explanation of his work is complemented by a sim-

ple approach to accessing the images.

The photographs are presented in a catalogue, and you can view them initially as thumbnails and then look at the actual images, which can be blown up several times over to reveal them in great detail. The main catalogue can be adapted and you can build up your own sub-catalogues, or projects, to let you more easily access images of particular interest.





There are also features such as a slide-show facility and database searching.

As an introduction to the photographer's sometimes difficult work, this is an approachable and sympathetic CD. The overview does not dodge the more controversial elements — it makes allusions to all of his photographic styles and the narrative treads a fine line between admiring him for his daring, and acknowledging that some people find his images unacceptable.

Mapplethorpe tried to push back the boundaries of what may be defined as art, but for many his work was nothing more than pornography. The CD reviews, at some length and without bias, the debate over subsidies that engulfed one of his exhibitions. At this point on the CD there are a few of his controversial photographs, and while these are relatively inoffensive, they are not the kind of thing you would want to show your maiden aunt. Those of a delicate disposition should remember that almost all of Mapplethorpe's work (even or rather, especially, his flower compositions) could be deemed suggestive.

If, on the other hand, you do want to see the riskier side of his work there is a whole CD devoted to it, called aptly enough, *The Controversy*. Alternatively, for the full story there is *Catalogue Raisonné*, which offers access to the



Mapplethorpe: probably not ideal for those of a delicate disposition

Illustration ©The estate of Robert Mapplethorpe. ©Digital Collections Inc. 1995

with Mapplethorpe and others. His style and approach are well documented and while you are encouraged to see the best in his work, you are given the space to make up your own mind.

Robert Mapplethorpe — an Overview

Contact New Media Solutions
0171 229 1708

Price £69.95

Rating ●●●●○

complete works.

This is highly recommended. as a basic introduction to Mapplethorpe. The photographs are

given prominence in the multimedia sections and are complemented by interviews

You Don't Know Jack

Berkeley Systems are better known as "the After Dark people" and true to form they have produced another superb product. A spoof of American quiz shows, this trivia quiz is loud, brash and hilarious nonsense. It refreshes the parts other spoofs cannot reach and takes the artform to the nth degree.

The CD plays as if you are on an imaginary radio quiz show, beginning with voiceovers of the production team setting up the show and continuing the theme with a quizmaster, musical introductions to questions and "Bronx cheer" buzzers that are used to answer questions. Needless to say, the whole thing is smoother than a pint of Guinness.

The questions are off-the-wall nonsense, but what makes them more fun are the equally wacky categories which you pick. Each is, ostensibly, related to the questions behind it. But don't think you're going to be able to guess the subject of the

question: the category "extra crispy" actually refers to anatomy. A typical question is: "If your cannibal neighbours invited you round for Kentucky Fried human, which bone would not be found in the pot at the end?" Yes, a lot of them are sick and many more appeal to vaguely smutty minds like mine, although the humour is more Steve Martin than Bernard Manning.

You can play on your own, or with others. In this latter case the game takes on a new angle. You have the opportunity to "screw your neighbour". Big, bouncing screws appear and you can play them like a joker, forcing your opponent to take a question to which you know they do not have the answer.

You Don't Know Jack

Contact Berkeley Systems 0181 741 8299

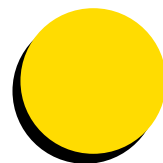
Price £29.95 inc VAT

Rating ●●●●●



Screw your neighbour with You Don't Know Jack

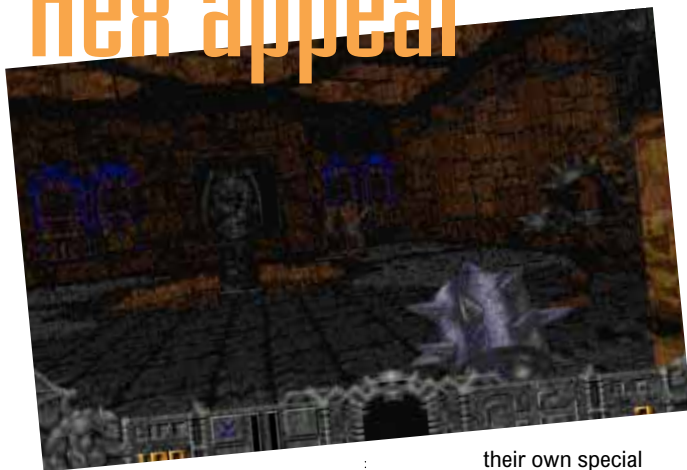




Screenplay

NEWS

Hex appeal



3D adventure lovers who got wrapped up in Id Software's shareware masterpiece Heretic will be pleased to hear that a sequel is on the way. Rumoured to be the last game to use the Doom graphic engine, Hexen continues the magic, mystery and mayhem.

Casting the player as a Fighter, Cleric or Mage, Hexen offers both swords and sorcery as you explore its levels. The aim this time is to defeat the evil serpent rider Korax, a nasty chap with a taste for world domination. Each character has

their own special armaments and abilities, and unlike Heretic or Doom, the game is divided into areas which are linked in a non-linear way, you access them with magical portals. Chances are you will have to visit each level more than once to complete the game.

Promising even more complex puzzles, improved sound and better graphics than its predecessors, Hexen will be released commercially on CD-ROM towards the end of the year by GT Interactive. Id has posted a four level Beta demo online for would-be heroes to try out.

GT Interactive 0171 258 3791

Developers dive in

Following the success of Windows 95-specific games like Pitfall 2: Mayan Adventure, Microsoft is set to release its own game software development kit (SDK) to 250,000 developers worldwide. The software giant is hoping that its new operating system will become a significant platform for entertainment, and is promising that 30 SDK-based titles will be available this Christmas.

Microsoft 01734 270001

Dynamic Duo

US-based Crystal Dynamics and BMG Interactive Entertainment have joined forces to release 15 titles for the Sega Saturn, Sony Playstation and PC. Crystal Dynamics is best known for its leading 3D titles, such as the 3D racing game Crash 'n' Burn and the Sonic-style platformer, Gex.

The launch console titles start with reworked conversions of the hit games Off World Interceptor, Total Eclipse and the strategy adventure The Horde. New releases include sports simulations, 3D Baseball '95 and an Arthurian graphic adventure written by Monty Python star Terry Jones, called Blazing Dragons.

On the PC side there's space spectacular Loadstar and Dust: A Tale of the Wired West. Set in 1882, the latter has you gunfighting with vicious killers, flirting with bawdy saloon girls and solving devious puzzles. Dust is available on CD-ROM only and has been written by Cyberflix, authors of Lunibus and Jump Raven. A Mac version will also be available.

BMG Interactive Entertainment International 0171 384 7500

Charts



1	Command & Conquer (CD)	Virgin
2	Championship Manager 2 (CD)	Domark
3	Need For Speed (CD)	EA
4	Phantasmagoria (CD)	Sierra
5	Fade To Black (CD)	EA
6	Complete Ultima 7 Classics (CD)	EA
7	PGA Tour Golf (CD)	EA
8	Rebel Assault — White Label (CD)	EA
9	7th Guest — White Label (CD)	Virgin
10	Ultimate Doom (PC)	US Gold
11	Space Hulk Classics (CD)	EA
12	Day of The Tentacle (CD)	US Gold
13	Dark Forces (PC)	Lucas Arts
14	3D Lemmings Demo (CD)	Sony Int
15	Full Throttle Demo Disc (CD)	US Gold
16	Indycar — White Label (CD)	Kixx
17	Banff Springs (CD)	US Gold
18	Magic Carpet 2 (CD)	EA
19	Star Trek — The Final Unity (CD)	Microprose
20	Star Trek 25th Anniversary (CD)	Virgin



Phantasmagoria

If you will insist on going down to the cellar alone and reading out the incantation that summons up the devil, don't go crying to Chris Cain.

Written by Roberta Williams, famed for her award-winning Kings Quest series, Phantasmagoria is the latest from leading PC adventurers Sierra On-Line. Boasting no less than seven CDs, it's a frightening tale of horror with an 18 certificate — a far cry from the company's usual fairy tales.

Without giving too much away, the game centres on a strange old house and a young couple, Don and Adrienne, who've just moved in. The opening sequence sees Adrienne having a ghoulish nightmare, complete with suitable music, and the action begins the next morning at the breakfast table.

Cast as the female lead, your first quest is to explore the house, located on a small island, and its surroundings. This leads to the discovery that it was once owned by Carno the Illusionist, a magician who put on a popular but scary side-show called Phantasmagoria. He also died a rather mysterious death at the house — you'll need to try it for yourself to find out what happens next. A large part of the game is finding out exactly what you have to do to complete it.

Phantasmagoria is split into seven chapters, each occupying a single CD. As you progress through the story, you're asked to swap discs, but you can play individual chapters in any order you like. However, leaping into the middle of the game will mean you miss out on information and useful objects from the previous parts.

Sierra has opted for a traditional point-and-click interface

with the main character wandering around the centre of the screen. Objects are easy to manipulate and anything can be highlighted when you pass the cursor over it. As you explore, a digitised Adrienne walks from room to room, occasionally stopping to check her appearance in the nearest mirror.

The reason for the game's 18 certificate is a number of what can only be described as horrific scenes. Blood splatters freely in the later chapters and there's plenty of violence; most of it against women. For example, one scene features a garden trowel being shoved through a woman's throat while another has someone being force-fed offal and blood through a funnel until they choke. These fit in well with the story, but the certification is certainly justified. The game can be censored and has a password scheme to stop uninvited players switching

things back.

Even though they're a little tasteless in places, Phantasmagoria's graphics are stunning. At 640 x 480 pixels they only run on machines with an SVGA chipset and the animation requires a Pentium or DX4 to do it justice. Impressive static rendered scenes are interlaced with captivating, if jerky, video footage. The audio is excellent and, combined with the images, generates an atmosphere that will have you jumping out of your seat during late night sessions.

Events in Phantasmagoria can become quite scary: you should see the shots we couldn't print!

Unfortunately, late night sessions will probably be limited due to the ease of the adventure. While I didn't finish it during the test period, I did manage to cover five chapters in one day and the puzzles aren't that difficult to solve. Some of Roberta's King's Quest games have proved more of a challenge, but if you're over 18 and like Sierra adventures then I thoroughly recommend playing it — just don't expect more than a couple of days' excitement.

System requirements

486/25 with 8Mb, Windows 3.1, 5Mb hard disk space, double speed CD-ROM, sound card with a DAC.

Price Suggested retail price £49.99

Contact Sierra On-Line
01734 303322

Magic carpet²

Magic Carpet 2 is mana from heaven, says Steven Helstrip. You'll never sleep again.

It's tough being an apprentice wizard, everybody knows that. But doing battle with Vissuluth's demonic wizard servants in the realms of Netherworld, that's really tough. Just as hard, in fact, as fighting off the scariest of them all.

That's right, I'm talking about the Spider Demon from Doom. Fortunately, help is at hand. Along with your trusty airborne carpet, there are one or two spells to cast, soldiers to guard you, and all the guidance you need from Kafkar, your old master.

Your quest in Magic Carpet 2 is ultimately to restore the "mana balance" of the world, which was fine before Vissuluth got his hands on it. The task is achieved by collecting and storing mana balls that float around the game's texture-mapped landscapes. Certain

monsters and demons that roam the land explode when killed, leaving mana balls in their wake.

At the beginning of each level, or realm, you must first build a castle. This isn't as difficult as it sounds. You simply cast the old castle spell and not one, but several, appear in front of you. From then on your job is simple: carry on collecting mana. The more you gather, the

bigger the castle gets, and the bigger the castle the more mana it can hold. This also strengthens any spells you may have found on your travels, and eventually you'll collect enough mana to move onto the next realm.

Each realm is more difficult than the last. In the first, all you have to do is put a few bees in their place, fireball some helpless sheep and fly to the exit. Eventually, however, the game hots up and you find yourself being attacked by huge monsters with increasingly big

teeth and more spiders than Arachnophobia. The final showdown at the climax of the game pits you against Vissuluth himself.

Unlike the first Magic Carpet game, the scenery changes constantly and you find yourself battling through the night, above villages, in caverns and even at sea.

You ride the carpet in much the same way as the first game. The core graphics engine is similar, but faster. The scrolling is smoother and the landscapes more detailed. As with every game at the moment, a Pentium processor is recommended but even on a 486DX2/50 with 8Mb RAM the game played well. You can also have up to eight players on a network.

Magic Carpet 2 is up there with Doom and Descent on the playability scale. It's so addictive that you'll never get any sleep again.

System Requirements

486 DX2/50 8Mb RAM, double-speed CD-ROM drive, 8Mb hard disk space, SVGA video card and monitor.

Price £44.99

Contact Electronic Arts
01753 549442



Joystick jury

No Christmas games page would be complete without a selection of joysticks, so the PCW team forced themselves to look at four of the latest controllers.

Gravis Phoenix

You want buttons? The Gravis Phoenix has got more buttons than a truck load of 501s. It's a huge beast taking up over 30cm of desk space — hardly inconspicuous.

Connection is more complex than it needs to be — it won't plug directly into the joystick socket. You are required to unplug your keyboard and piece together a convoluted mix of male and female connectors.



You then have to connect the stick to the base with a phone-style connector and finally calibrate it in Windows.

So now you're ready to start firing on all buttons, yes? Well actually, no. None of the games I tried supported the Phoenix and so I was left using just two fire buttons: you might as well use a far simpler device.

The actual feel of the Phoenix was hardly inspirational — an over-sensitive joystick made it difficult to control movement.

Paul Fisher

Verdict Over-priced and over-engineered device. Give it the bird.
Price £99

Contact All Gravis sticks available from Mills and Mills 0171 352 9429

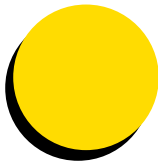
Gravis PC GamePad

The Gravis PC GamePad is a nice departure from your standard,



run-of-the-mill joystick. It's very compact and rather similar to a Nintendo game pad. There is a thumb-pad controller instead of a hand-held joystick although you can screw a small lever into the centre of the controller to make it look like a mini-joystick. It has four colour-coded, quick response buttons and two switches: one to give the option of left or right-handed play and





the other to select button configurations such as single shot and/or turbo-fire. It fits standard 15-pin joystick ports without difficulty and will work on PCs with an analogue joystick-compatible game card.

Dylan Armbrust

Verdict A good buy for those wanting subtlety, yet excellent performance.

Price £24.99

Euromax Phase 9 Phantom 2

The Phase 9 Phantom 2 is bulkier and sturdier than the



Gravis PC Game Pad. Finished in a fashionable clear plastic casing, it features an eight-way directional thumbpad and four colour-coded main fire buttons on top. Two extra buttons at the front

give left and right index finger action — a direct rip-off of Nintendo design.

No driver software is supplied but the pad connects directly to the PC's gameport and it worked straightaway with all the games tested. The feel is excellent and the Phase 9 proved ideal for arcade titles like FX Fighter and the long-awaited Mortal Kombat III.

Chris Cain

Verdict Not great for flight sims but ideal for arcade action, the Phase 9 Phantom 2 certainly gets the thumbs up from me.

Price £19.99

Contact Phase 9 Phantom 2 from Euromax on 01262 601006

Gravis Analog Pro

The Gravis Analog Pro is designed for both flight-simulation and arcade-style games. It consists of a padded joystick set into a paperback-sized base. There are two fire buttons and a trigger on the stick, with two more buttons on the base.

The buttons can support up to four independent functions, selected via two thumbwheels



on the right edge of the base.

A third thumbwheel acts as a throttle control and can be switched off to avoid conflicts with a second joystick.

The joystick tension is adjusted by means of a larger thumbwheel which peeps out from both the back and front of the device. The Analog Pro comes with a disk of calibration utilities, but proved responsive and easy to use when plugged in straight out of the box.

Clive Akass

Verdict Compact and versatile.

Price £39.99

Microsoft Sidewinder 3D Pro

The Sidewinder 3D Pro is a stylish looking joystick with ten buttons, a rotating shaft and both digital and analogue operation modes. Its semi-circular base creates the feel of a

space-age control panel and takes up only 22cm of your precious desk space. What more could you possibly want?

Well, how about one that works? Installation is easy but despite claims by Microsoft, getting it to work in DOS certainly isn't. After a rather scary, out-of-control experience in Descent and a few other games, I tried it under Windows 3.x only to get the same results. Only when calibrated within Windows 95 did the Sidewinder start to behave.

Nicola Kingsley

Verdict Pretty expensive, but possibly worth it under Windows 95.

Price £69.99 with Fury3.

Contact Microsoft 01734 270001



Leisure Lines

Brainteasers courtesy of JJ Clessa.

This Month's Quickie

I have a rectangular box — the area of the top is 72 square inches. The area of the front is 48 square inches and the area of the end is 24 square inches. What are the dimensions of the box?

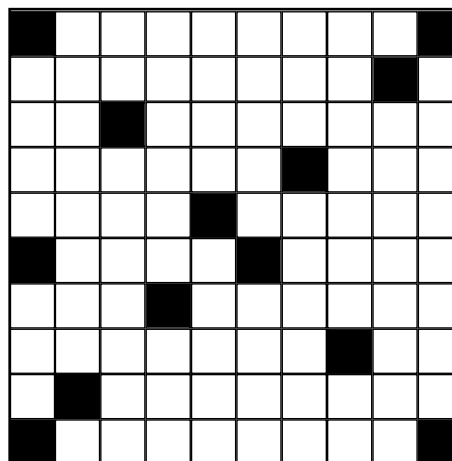
44	3548	2194480
67	6186	2746013
70	8818	3282601
94	9733	5468883
293	17689	32055162
430	67061	39486723
468	68986	60216141
682	355688	83396672
714	402683	88680472
1631	724301	89875671
2076	764156	92408817

This Month's Prize

Puzzle

A Merry Christmas and a Happy New Year to you all. Here's the usual not-too-difficult puzzle for the party season.

1631	724301	89875671
2076	764156	92408817



Arrange the numbers given into the grid — some across and some down — in the manner of a crossword. When you've done it, cut out (or photocopy) the completed grid and stick it onto a postcard, or the back of a sealed envelope. Then send it to the address below:

PCW Prize Puzzle January 1996, P.O. Box 99, Harrogate, N. Yorks HG2 0XJ, to arrive no later than 20th January 1996. Good Luck!

Winner of the October 1995 Prize Puzzle

A good response — just over 100 entries — to a problem which I thought was more difficult than usual. Perhaps a better assessment of the problem was given by the reader who said that it was not so

much difficult, as messy.

Anyway, the two correct solutions were 18181 and 18481. The winning card came from Ray Cook of Sheffield. Congratulations, Mr Cook, your prize is on its way.

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Hands On is the place where readers can contribute to **PCW**, and as always we'll pay for anything we use. Macros, sections of code and hints and tips will be rewarded with a £20 book or record token (please say which you'd prefer) and we'll pay hard cash for longer, more involved pieces. Please include relevant screenshots in **.GIF** format.

All submissions should be emailed to the author of the appropriate section, or snailmailed to Hands On, *Personal Computer World Editorial*, VNU House, 32-34 Broadwick Street, London W1A 2HG. Questions and short hints and tips can be faxed on **0171 316 9313**.

We're constantly working to improve the contents of Hands On. If you have any suggestions, send them to the **Editor** at the address above, or email them to:
editor@pcw.ccmil.compuserve.com

MICROMART INDEX

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The Explorer quest

Not quite your Ranulph Fiennes, but none the less intrepid for all that, Tim Nott leads you to the answer to an FAQ about Explorer and hacks his way through other little-known aspects of this utility.

The Lord, it is said, moves in mysterious ways. Equally mysterious are those of Windows 95 folders and Explorer.

Let's start with an FAQ — a Frequently Asked Question. How do I persuade Explorer to start without expanding a drive? By default, it starts with the left hand pane showing a tree structure, with Desktop at the top, then My Computer, Network Neighbourhood, Recycle Bin and Briefcase on the next level.

My Computer (or whatever you've renamed it) branches to each logical drive on your PC, as well as entries for Control Panel, Printers and possible other folders, such as Dial-up networking. However, it's the drives we're interested in.

Say you have a PC with floppy disk on A:, a hard disk split into two partitions C: and D:, and a CD-ROM on E:. Explorer will, by default, expand the first level of folders in C: and show all its contents in the right hand pane. If you've got more than a score or so of folders in the root of C:, this means you have to collapse the branch (click on the minus sign to the left of the drive icon) or scroll down to see D: or E:. All of which is rather a pain in the pane, so to speak.

Fortunately, Explorer has a variety of startup switches which enable it to perform in different ways. You'll find this information in a file called Tips.txt which should be in your main Windows 95 folder. Failing that, it's also in the Windows Resource Kit Helpfile on the CD-ROM, situated at Admin\Reskit\Helpfile\Win95rk.hlp. The command line parameters are:

```
EXPLORER [/n] [/e][,/root,object][[,/select],subobject]
```

If you find the explanation that follows

totally baffling, then you are not alone. However, after much trial and error with the final beta I did manage to get it to open, unexpanded. Then, when the release version arrived, I lost the magic formula and it reverted to its old ways. So a big thank you to Eric Chapman who posted the following hint on CIX:

Right-click on the Start button, then Open. Double-click on Programs in the folder that appears. In the next folder you should find a shortcut icon (it has a little arrow at the corner) for Explorer. Right-click on this and choose Properties. Click on the Shortcut tab in the property sheet, and change the entry in the Target box to:

```
C:\WINDOWS\EXPLORER.EXE /n,/e,/select,C:\
```

Make sure you get all the commas and slashes right. You can, if you want, put a different drive letter before the final backslash. Explorer will then open with no drive expanded, and C: (or the letter you've specified) highlighted.

Screen horror

Explorer is actually responsible for far more than the tree/contents window that appears when you click on its icon. It's the Windows "shell" and, like 3.1's Program Manager, is running all the time. Try closing any Explorer windows and press Ctrl+Alt+Delete. This will summon the Close Program dialogue box. You'll see a list of all programs running — including those that work behind the scenes and don't appear on the taskbar. Select Explorer and click on the End Task button, and the Shut Down Windows dialogue appears. Similarly, try running Explorer from the Run command without the /e

switch — you'll see a normal, single-paned folder window open.

You can also Explore from an open folder by right clicking on a sub-folder and choosing Explore. A quicker way is to shift-double-click on a folder. But there is a rather tedious trap here: if you're not careful this will open an Explorer for every folder up to the one on which you double-click. Once the process has started there seems no way of aborting it — you just watch in horror as the screen fills up with Explorers, and then close them all individually when it has finished.

What happens is that when you open a folder, the first item is semi-selected. It isn't highlighted, but there's a dotted box around it. Shift-clicking on another item selects everything in between, and if these are all folders, then they will all get Explored. Logically, it should take three clicks to do this, but logic keeps a low profile in Windows 95. The way to avoid it happening is to select the folder you want to explore with a single, unshifted click, then shift-double-click.

Windows allows you the option of opening new folders as separate windows, or replacing the contents of the existing one. You set this behaviour from the View/Options menu. Whichever option you choose, you'll probably find occasions when you'd rather it did the opposite. For example, in "same window" mode you might find yourself wanting two folders open so you can drag files between them. Or in "multiple windows" mode you might want to open a deeply-nested folder without cluttering up the screen with all its ancestors. However, if you hold down the Control key as you open a folder, the

behaviour reverses on a one-off basis. You doubtless know that pressing the Backspace key opens (or switches back to) the parent folder, but Ctrl+Backspace doesn't appear to work — you have to Ctrl+click on the "Up one level" button instead. And don't forget that holding the Shift key down when you close a folder closes all its ancestors.

Christmas reprise

This time last year, the *Hands On* editor, Gordon Laing, suggested that we each

produce a Christmas wish-list. Gordon has since moved to the other end of the magazine, but I'm pleased to say that our current squadron leader, Eleanor Turton-Hill, is upholding tradition, although management cutbacks mean we're down to five wishes against last year's ten.

Before I send this year's list (see the panel page 289) fluttering up the chimney, it's interesting to see how many of last year's dreams came true.

Wishes one and two concerned the price of RAM. We all need more of it, and

Mystery of the month

This month's mystery is one that had me completely stumped at first: reader Martyn Goodman wanted to know how it is possible to modify something that doesn't yet exist.

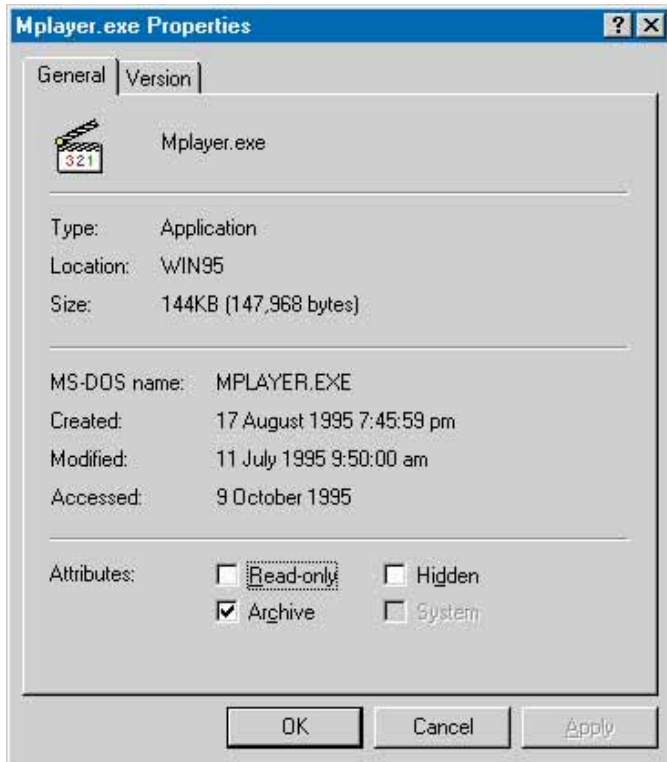
This is not a philosophical paradox, on the lines of "travelling back in time to before you were born and killing your parents", but refers to the information given in some file property sheets. Sure enough, when I looked, I found that I had a load of files that were created on 17th August 1995, but which had been modified more than five weeks earlier. The confusion stems from what is meant by "creation date".

Windows 95 keeps track of three dates per file: the date at which the file was created on your hard disk; the date it was last accessed (the last time you ran a program

file or read a data file without necessarily changing it); and the date it was last changed.

Windows 3.1 only showed the last of these, and this is also the date that appears in a folder with Details turned on. Since most of us don't modify program files, then this is usually the date-stamp given to the file by its original creators and was previously known, quite reasonably, as the "creation date". This is often a useful aid to identification: the time for Windows 95 files is shown as 9:50 a.m.; and Windows 3.11 as 3:11 a.m. However, the Created field in the property sheet refers to the date the file was created locally, on your hard disk.

Mystery solved, I hope.



*A blow to
Creationists
— can
Windows
really
time travel?*



my fervent desire was that someone would put out the fire in the resin factory, or at least come up with some plausible explanation for why it continues to be so expensive compared with processors and hard disks.

A quick look at the prices in corresponding issues of *PCW* shows that hard disk prices have once again tumbled dramatically — a 1Gb drive can be had for under £250, which works out at 25p a megabyte. Practically everything else is cheaper, too: motherboards, processors, peripherals and software. RAM, on the other hand has dropped only slightly in price; it's still about one hundred times the

price-per-meg of hard disk space. Five years ago the ratio was around ten to one. Keep trying, Santa.

Wish three was for a decent Windows text editor. At the time, I reported that I'd already opened this one, in the shape of Windows 95 beta WordPad, which had all sorts of improvements over Write such as: drag and drop editing, a toolbar, and the ability to read and save RTF and Word 6 documents. To my acute embarrassment, I actually wrote I think I'm in love. Not any more. For a start, the release version shows a distinct downturn in speed; it's only about 25 percent faster than Word 7 to load a big document. Write does it

almost instantly. Furthermore, Write had headers, footers, decimal tabs and full-justified margins. WordPad doesn't.

And if you're thinking of taking a Word 6 or 7 document home for the weekend, and editing it in WordPad, you'll notice that you've lost the greater part of the formatting. Sorry, Santa, but the wheels have fallen off this one.

Wish four was my periodic howl for a keyboard whose layout was based on something a little more ergonomic than the 1872 Scholes Typewriter. Dream on, Tim.

Wish five was for the Windows 95 programmers to move the Close button away from the Maximise and Minimise ones.

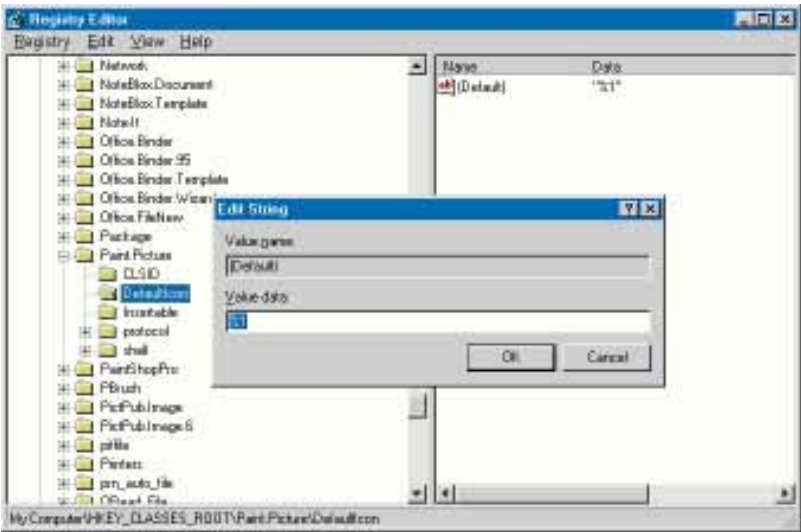
Bits & PCs

Good news and bad news for Microsoft Office users.

- The good news, which I discovered purely by trial and error, is that Windows Paint will use the graphic import filters supplied with Office. It tries to keep this secret, as they don't appear in the list of file types, but I've managed to load .GIF, .TIF and .JPG files. This is strictly a one-way exercise because you can't save in these formats, but I'm none the less impressed.
- The bad news, which I'm glad to say I didn't find by trial and error, is that if you enter 1.40737488355328 into a cell in Excel... well, try it and see. Weird, is it not?

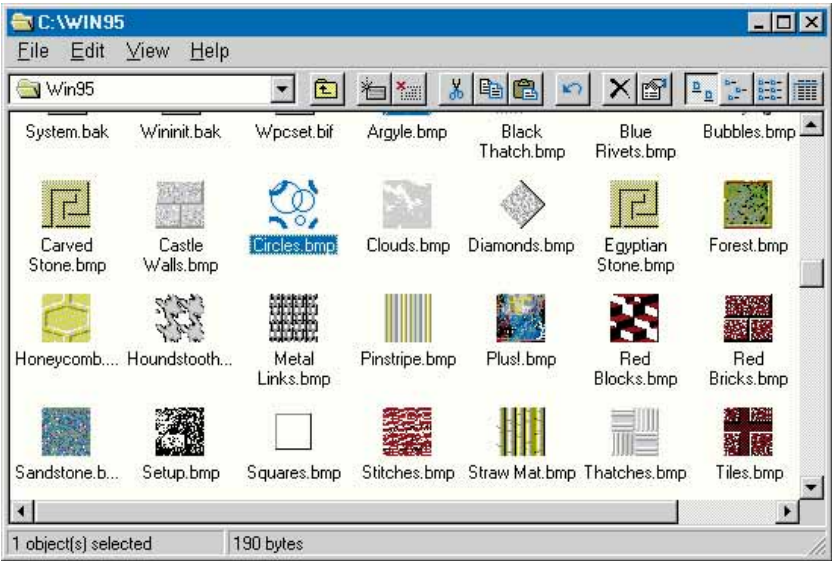
Pretty silly

● Here's a fairly useless, but rather clever, trick that involves editing the registry; so you may want to make back-ups of USER.DAT and SYSTEM.DAT first. Run REGEDIT, and click on the plus sign next to HKEY_CLASSES_ROOT. Scroll down until you see Paint Picture and click on its plus sign. Click on the folder that says DefaultIcon, then switch to the right-hand pane and double click on Default in the Name column. A dialogue box opens, letting you edit the contents of the entry in the Data column. This should contain the location of the icon — normally "C:\Progra~1\Access~1\MSPAIN.TEXE,1". Pausing only to wonder why the registry can't handle long folder names, change this



Left
Editing the registry entry for Paint Picture icons...

Below
...and the result



to "%1". Don't type the quotes — the editor will add its own double quotes. Close REGEDIT (it saves automatically). You

should then find that all .BMP files appear in folders, not with the default Paint icon, but as miniatures of themselves.

Christmas wishes

Dear Santa,

Please ask Microsoft to place a few windows in its Chinese walls. Then the developers of Office could see what the Windows 95 mob was up to. I like the way the accessories such as NotePad, WordPad and Paint show the file first, then the application on the title bar or the task bar. This is the document-centric approach, and it's a great improvement — after all, you can tell the application from the icon picture. So why on earth didn't someone tell the Office team about this? To add insult to injury, it's not just "Word" or "Excel", followed by the data file that appears on the taskbar buttons, but "Microsoft Word..." Hence, after a busy hour or two you end up with several buttons all saying "Mic..."

And while the Office crew is making its products Windows 95-compatible, how about a bit of feedback the other way? Why not make the Windows 95 accessories Office-compatible so we can add Paint files to an Office Binder, for



instance?

And can you remind Microsoft about MDI — the multiple document interface? Opening separate folders, or Explorer sessions, is a tedious way to move files about compared with the old multi-paned File Manager.

And getting back to Binder again — why is there no way of tiling documents there? When I looked at the beta version of Windows Quickview, I distinctly remember having seen viewers for JPEG and GIF files. So why aren't they there any more? Can we have them back please?

Please give me the patience and understanding to get to grips with the way in which Windows 95 saves settings, or not, as the case may be. You may remember we used to be able to do this with the File and Program Managers. I realise this is going to take a long time, but I would like to pass this information on to the readers of my column. Can we please start with "How do I stop Windows re-opening all the folders I was using when I last shut down?"

They didn't, and now I've grown used to it I'm very glad they didn't and I retract that one completely.

Alas, the Whoops button (for cancelling the loading of a program one has launched by accident) didn't happen either, but my next wish did. It was for a create directory button in File/Save dialogues. Santa really went overboard on this one, as I can now rename, copy, move and delete files, Quickview them, send them to another application and generally do all the things possible in a normal folder, without leaving the Open/Save as... dialogue.

Wish seven was for a way of password protecting — particularly from six-year-olds — applications and directories on a standalone PC. Pausing only to update that to *seven-year-olds*, I can report that Windows 95 is better at this but still not good enough. I will cover this in greater detail in a later issue.

Wish eight was a subscription to Which Internet Book magazine. It was meant as a joke, but I am now informed that such a thing exists.

I'm still waiting for wish nine, the UK

version of Encarta, and since no-one fulfilled wish ten — a bottle of Bushmill's Black Label — I bought my own.

Grovel

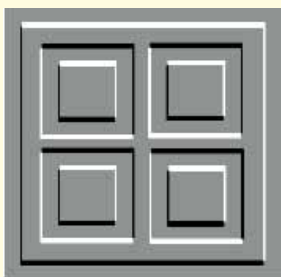
In the November issue, I explained how to change the startup screen, and wrote Make a back up of LOGO.SYS, which you'll find in the root directory of your boot drive. My apologies go to all those who have been trying to find a non-existent file, and thanks to the readers who emailed me, pointing out the error.

Mark Lovell got there first, stating correctly that this file isn't installed by Windows, but by the Plus! pack. The default startup screen is built in, but any 256 colour .BMP file, 320 pixels wide by 400 high, saved as LOGO.SYS in the root directory, will override it.



PCW Contacts

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A wish come true

Tim Nott was longing for one of the more useful facilities of Win95 until he discovered that it was available for Windows 3.1 — soon his screen was sprouting more buttons than a Christmas panto.

One of the more pleasant aspects of Windows 95 is that you can do practically anything from the common "File Open/Save As..." dialogue box: rename, copy, delete and move files, view them and create new directories. No — there hasn't been a printing error, this is indeed the *Hands On Windows 3.1* column.

Such a feature has long been high on my wish list. In fact, I was going to include it in my "Dear Santa" section until, much to my surprise, I discovered that it already exists for 3.1 users. Even more surprising, it has been around for some time — the version 3.01 that I downloaded from the Windows/Files topic on CIX, dates from May 1994 (although there is a more recent beta version in circulation). With commendable respect for one's system, it doesn't add any files to the Windows or System directories, but adds just one line to WIN.INI and leaves SYSTEM.INI well alone.

Run Instant File Access (IFA) — the authors recommend you put it in your Startup group — and you'll find that your File Open/Save As... dialogues have sprouted a row of buttons and a status bar.

The latter, which is simpler, gives you the number of files, total size and creation date of the selected directory, or the details of a selected file — not vital, but nice to know. Turning to the button bar, this is indeed a thing of wonder: the first two buttons produce lists of recent files and directories accessed by the current

application. Next, four more buttons let you rename, delete, copy and move files. Then there is the magic Create Directory button. I've lost count of the times I've taken screenshots in Paintshop, and realised that I should have created a separate directory for them first. This saves the chore of having to stop whatever you are doing to fire up File Manager. Then it starts to get complicated, but fortunately each button has Tooltips which offer a brief description if you hold the pointer over it. More detailed pop-up help panels are available from the Windows 95-style

What's This? button.

The authors at Alexoft of Quebec obviously can't leave a good idea alone as there are all sorts of options available for each application's database of recent files. You can make items permanent or display the list in a floating window, and if the application supports different file formats (such as .txt and .wri) you'll get separate lists for each. There's a button to edit file attributes as well as a search and, rather dangerously, replace feature for text within files. Finally, if you have an aversion to buttons, you can access the features through a right-mouse-click menu.

I was going to have a moan about it replacing the "added value" file dialogues of Word and Excel, but they've thought of that, too: hold down shift, and the original dialogues appear instead. Instant File Access should be on this month's CD and the documentation also gives Alexoft's CompuServe address: 72154.15@compuserve.com.

Five easy pieces

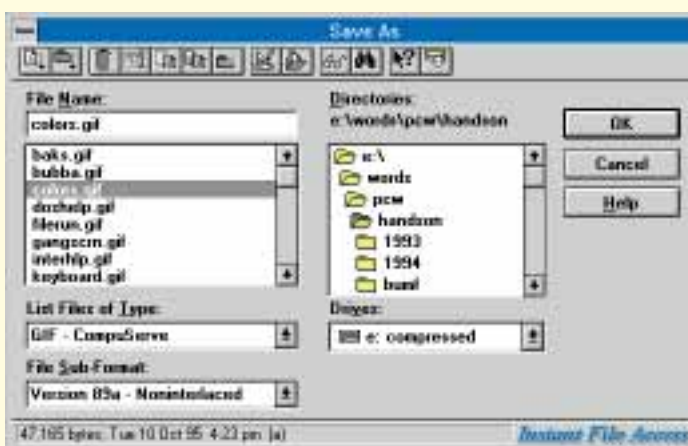
Another feature that Windows 95 users can play with is Scraps. These are OLE objects, created on the desktop by dragging and dropping, for example, a selection of text. One use for these is as a multiple clipboard; dragging sections of text in and out of WordPad or Word.

I've often pined for a multiple clipboard — without the inconvenience of having to save clips as individual files — and Ron Cox's Xboard seems just the thing. It's by no means new, judging by the file dates, but it's the first time I've come across it and it comes in both 16-bit and 32-bit versions. It's strictly text only, and consists of a little window divided into five panes; each can be filled from the clipboard by right-clicking, or re-loaded to the clipboard with a left click. And that's all there is to it. Neat, simple and on the CD. It's also



Left Xboard gives you up to five chunks of text ready for instant access

Below All that Windows 95 users have and more, from IFA's common dialogue enhancer



Top Tips for Windows

Registration Database The registration database editor (REGEDIT.EXE) will show you a list of all registered file types. It's worth going through this occasionally and removing entries that relate to applications no longer on your hard disk.

File Manager You can use the "Select Files..." command on the File Manager "File" menu in all sorts of ways. Entering "b*.*" in the box will select all files beginning with "b". Similarly, "*.EXE" will select all executables. Selections are cumulative so you can repeat the process, or use multiple criteria separated by a comma. "*.WRI, *.TXT, *.DOC", for example, will select all the Write, Notepad and Word documents in a directory.

Colours Mix your own Windows colours by going to Control Panels/Colours. Click the Colour Palette button, then the Define Custom Colour button. Click on one of the 16 empty Custom Colour swatches and define the hue by dragging the cross horizontally across the spectrum. Adjust saturation by dragging vertically and luminance by dragging in the narrow bar to the right. When you find the colour you like click the Add button. To get pure rather than dithered colours you'll need a display card capable of showing more than 256 colours.

Paintbrush You can edit any of the colours in Paintbrush's palette by double-clicking on the swatch. You can then save or reload custom palettes from the Options menu. Again, you'll need better than a 256-colour display to obtain pure colours.

Memory loss If "Help/About..." reports your free memory to be around one-thousandth of what you expected, check the Control Panel/ International/Number Format button. If you don't have a thousands separator defined, then Windows will exhibit this peculiar,

but harmless, bug. It also affects the Word for Windows word-counter, according to which this column consists of just one word.



Fine tune your desktop colours from Control Panel

Christmas wishes

Dear Santa,

Could you please make sure developers carry on developing for Windows 3.1? Not everyone can, or even wants to upgrade to Windows 95. And seasonal good wishes to Lotus, which has just delivered the latest version of SmartSuite, with new Windows 3.1 versions of WordPro, ScreenCam and Organiser.



I'd also like a really, really nice display card. It has to be fast, capable of displaying 65K colours at 1,024 x 768 pixels, with a utility to switch resolution without restarting Windows. That's the easy bit: it must also come provided with both Windows 3.1 and 95 drivers that support all aspects of both platforms, not conflict with COM ports, not throw a wobbly when returning from a full-screen DOS session and not be prone to mysterious General Protection Faults. (That, I realise, probably is asking too much).

An all-purpose drawing package that combines the ease of use and precision drawing aids of Autosketch with the speed, transparency and image quality of Xara Studio would be nice. Let's make it difficult by asking for accurate perspective, as well.

Pure indulgent whimsy, but I'd like a screensaver of a waterfall. This would be written using some clever fractal coding, so it produced a near-photographic image of tumbling water that changed constantly without repeating itself, complete with suitable sound effects. In the same box would be a more tranquil Babbling Brook saver, and another of Drifting Clouds.

I'm only allowed five wishes this year, so I'm going to cheat by asking for a Software Users' Charter. This would provide draconian punishments for companies that release software without an uninstall routine, CD-ROM multimedia titles that copy more than 100Kb to the hard disk, or that don't copy the program icon so that it's lost when you change resolution, and any application that insists that you decrease the screen resolution and/or colour depth before running. Thanks.

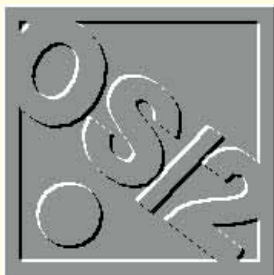
Tim

in the Windows/Files topic on CIX, as I have uploaded it there. According to the readme file Ron Cox can be contacted at roncox@indirect.com or 71722.3175@compuserve.com.



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Core blimey

Terence Green is pleasantly surprised by a common code base which brings OS/2 and Windows closer together, finds ways of making Warp run more smoothly and does his bit to revive the true spirit of Christmas.

In my first OS/2 column, I wondered why OS/2 general business applications were so slow in arriving and why develop-

ers appeared to lack interest in a reliable, field-tested 32-bit operating system. Having suggested that OS/2 Warp would be

seen in a more favourable light once Windows 95 had been shipped, I reckoned that 32-bit Windows 95 applications would be easier than 16-bit Windows 3.1 applications to port to 32-bit OS/2 Warp.

Only weeks later, an answer has arrived. A Lotus and IBM co-development called the Developer API Extensions for OS/2 (DAPI) will enable developers to create applications for OS/2, Windows 95 and Windows NT using a common code base that encompasses about 80 percent of the development effort.

Daffy about DAPI

The possibilities became clear in October when I watched a Beta demonstration of the next version of Freelance Graphics for OS/2 and talked to Greg Schumacher, senior manager for advanced technology at Lotus.

Schumacher says the Freelance code is actually 99 percent Windows 95 code re-compiled for OS/2. The magic that makes this work is DAPI, which was announced back in May (prematurely, it appears, given how long it is taking to finalise). DAPI makes the commonality usable where Windows and APIs are alike in all but name and adds APIs to OS/2 where it lacks some Windows features.

At the time DAPI was announced there was an incorrect suggestion that it was "OS/2 Warp supporting Windows 95". IBM was content to let that impression be given but DAPI looks like being a lot more useful than the ability to run Windows 95 applications on OS/2 Warp.

Many think that OS/2 won't survive if it can't run Windows applications. This is nonsense. The Win32 API for Windows 95 and OS/2's 32-bit API have much in common because they share common roots, but it's where they differ that developers can innovate and users can

Three Christmas wishes

What I'd most like for Christmas is for BT to provide every school with a free connection to the internet. Then for myself I would like a new home computer and a ThinkPad 755CX.

My first wish was actually written before the Labour Party conference but I'm not prescient — it's an old idea. It's about a sense of community and about giving as well as receiving; best of all it's about children, which is what Christmas is all about — remember that baby in the manger?

Deregulated communications infrastructures around the world that were built by public subscription are becoming cash cows for speculative shareholders. By giving kids access to a worldwide information resource, the telecommunications carriers won't simply be paying back the community input that built their profit engine — they'll be giving kids the chance to tap into a far bigger resource than any school library can deliver. They'll also be fostering generations of adults who'll deliver a far bigger payback for the carriers than the couch potato video viewers and home shoppers they seem to be banking on now.

Ignore those who say that the internet will lead to information overload — we've been brought up on centuries of minimal-content information streams, restricted by class or censored by government. Are we subject to good decisions as a result? Yugoslavia, Muroroa? The former British Rail? The Ozone hole? Doubly ignore the idiots who warn you about porn on the internet



— they'd just prefer you to read their who's shagging whom columns in the tabloids.

Wish number two is for a new home computer because my old one is wearing out. It only has a 486 processor, admittedly a 66MHz DX2, and 8Mb RAM which I'm beginning to find constricting. It's not enough to run any of my three favourite operating systems — Windows 95, OS/2 Warp Connect, Windows NT Workstation; 16Mb sounds about right. And while I'm about it, I might as well ask for a Pentium 100, a PCI bus, and a 1Gb hard disk.

My third wish is for an IBM ThinkPad 755CX. The ThinkPad is one of the best notebook computers I've seen. The design is great and the infra-red ports for LAN and printer communications are a terrific idea. But the best part of the ThinkPad is the Mwave Digital Signal Processor. Think of it as a second processor. It's a multimedia processor, a telephony processor, and it will soon be a voice recognition processor. At the moment you need a VoiceType adaptor to handle voice input, but next year IBM will ship software that lets the Mwave do what the VoiceType adaptor does now.

All the Mwave's cleverness is controlled through software and being a CPU in its own right, it leaves the ThinkPad's Pentium largely free to handle other computing tasks. As a telephony device, the Mwave delivers a 14.4Kb/sec fax/modem, a speakerphone, and an answerphone. With no more than a software upgrade, the modem will soon do 28.8Kb/sec.

Tips & Tricks

Tip of the month if you use Warp Connect is to dump UltiMail Lite. IBM has. It will be replaced by cc:Mail from Lotus. In the meantime, try out Post Road Mailer (see illustration). This is a neat shareware mailer that supports POP3 and SMTP and costs \$50 for a single user.

You can find the Post Road people and more information at <http://www.aescon.com/innoval/index.htm>

Another good tip is to download the latest IBM WebExplorer 1.03 from ftp.ibm.com in the pub/WebExplorer directory. It's heaps better than the previous version, has a newsgroup manager, and text and in-line pictures now stream in much faster than before.

Are you having trouble running Windows or DOS applications in Warp? Do they sometimes appear to start but then remain dormant? Try tuning your settings. Right-click on the program icon of the DOS or Windows application in question, open the Settings menu option, go to the Session notebook page and select the Settings icon. Make sure that the settings below are set, save them, and try running the program again.

DOS memory settings:

```
DOS_HIGH = 0n
DOS_UMB = 0n
EMS_MEMORY_LIMIT = 0 or 2048
DPMI_MEMORY_LIMIT = 64
XMS_MEMORY_LIMIT = 4-10Mb
```

DOS video settings:

```
VIDEO_FASTPASTE = 0n
VIDEO_WINDOW_REFRESH = 5
```

Other DOS settings:

```
HW_ROM_TO_RAM = 0n
IDLE_SECONDS = Max (60)
IDLE_SENSITIVITY = Max (100)
DOS_FILES = 50 (or more)
```



Post Road Mailer 1.03 in action — a nice piece of work and far easier to get to grips with than UltiMail Lite.

Are you having difficulty installing OS/2 Warp? Does it fail to complete the install process? Disable any Shadow RAM in the BIOS. If that fails, try disabling the secondary memory cache too.

Some motherboards have poor memory logic or timing; OS/2 uses all the memory to its limit and will stress out cheapo designs.

If you have an AMI BIOS, disable "hidden refresh" and "fast decode enable". Never mix and match RAM — it's asking for trouble. Three-chip and 9-chip SIMMs don't work well together. All RAM modules should be of the same type and speed, preferably 70ns or 89ns for 486s.

perceive the merits of each platform.

When an operating system hosts foreign applications it does so at the level of the lowest common denominator. Take Windows 95 applications running on Windows NT. Windows NT supports Unicode so making software international is much easier to manage. Windows 95 doesn't. Windows NT supports local security. Windows 95 doesn't. So you can develop a single application which runs on both platforms passably well but exploits the best features of neither.

It is better to develop a core code base that is compatible with both Windows 95 and Windows NT. Then you add the bits that allow the Windows NT version to exploit all Windows NT's capabilities — robust multitasking, Unicode, security. To the Windows 95 version you add all the flashy multimedia elements that Windows 95 can do now while Windows NT can't.

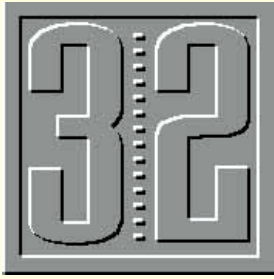
This way you get two applications that exploit their native OS but you don't have twice the work. DAPI lets developers put most of their effort into producing the core code. The rest of their work goes towards making sure that they fully exploit the capabilities of each platform.

Lotus is developing SmartSuite this way, instead of as before having two separate platform teams developing distinct applications and trying to keep them in sync, which as we know didn't work.

With luck we should see SmartSuite for Windows and SmartSuite for OS/2 converged by mid-1996.

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The word processor is dead...

Long live the text processor — Emacs is versatile, hardware-friendly, cross-platform and free. Is it too good to be true? asks Chris Bidmead. Plus news from AIX.

Back in the late seventies when I first started messing about with computers a debate raged about the relative benefits of WYSIWYG word processing versus what was then thought of as “conventional text processing”. To the average PC user today, it seems unthinkable that a mere text processor could challenge a word processor like Microsoft Word. Text processors merely handle text. They don’t deal (at least not directly) with refinements such as italics, bold, fancy paragraph formatting, embedded graphs and pictures. And they don’t show you in advance what your pages are going to look like when they hit the printer.

I must confess I’d readily accepted the pro-word processor proposition, until a number of mailings from readers started me thinking about it again. The debate has been sparked off by Caldera’s advertised move to port WordPerfect to Linux.

Let me fill in some background here. In 1988, in a move that was to prove dangerously debilitating to the company, Borland introduced a new word processor to the market. Borland Sprint challenged established word processor products like WordStar, WordPerfect and Microsoft Word on a number of fronts.

Firstly, it was easily adaptable, so it could be made to function like any of them — remember, these were all character-based; Windows had not yet caught hold. This was because it included a “deep” macro language that made it simple for even casual programmers to remodel not just the key-stroke mapping, but also the behaviour of the software. In fact Sprint was really just a bundle of low-level text handling primitives held together by the macro language. The macros were compiled, not interpreted, which made it fast and kept it fast, no matter how many complex macros you felt inclined to add.

Another key difference from the established word processors was that Sprint

came with a separate formatting program. Yes, it made a stab at previewing the final page on the screen if you insisted, but primarily it kept text formatting separate. The formatter could do very complex page layout, picking up visible ASCII format commands that you left in the text, but you didn’t need to see the effects of these as you wrote (so went the theory) because you trusted the formatter to create the page according to pre-set rules you had laid down. A simple example: you didn’t need to check each page to make sure that paragraphs stayed attached to the headers that preceded them, because the formatter understood that certain types of headers shouldn’t be separated from the text that followed. Yes, I know that today’s word processors understand these kind of rules too, but that’s because they’ve absorbed the lesson.

Familiar friend

I used Sprint regularly until GUI word processors became dominant with the arrival of Windows 3.0. As a matter of fact, Sprint had arrived as a familiar friend, because it was based on a product called FinalWord, which I’d been using since the mid-eighties. FinalWord, in turn, was the offspring of PerfectWriter; a CP/M word processor on which I’d written a couple of my Doctor Who scripts back in 1980.

CP/M was very tight on memory, and all the other CP/M word processors I’d tried couldn’t cope with a whole script as a single file. And the separation between composing the script and formatting it for printing was a real boon. The convention for Doctor Who scripts was to confine the dialogue and stage directions to the right-hand half of the page, leaving the left section blank for camera directions. But composing the dialogue like this meant wasting half the screen. PerfectWriter let you forget about formatting while composing a scene.

Writers should never have to bother



The UK Windows NT-based systems vendor ServerWare sent out over 5,000 CDs to customers to demonstrate new applications. Unfortunately, the accompanying documentation in Microsoft Word format was infested with the so-called “Prank” macro virus, one of the first known viruses in the wild to be passed via data files. ServerWare quickly issued a fixed version of the CD, and thoughtfully included this unique Word document, which not only explains the virus, but contains its own anti-virus macros to get rid of it!

with formatting, in my opinion. (But writers are funny people. I remember discussing this with Lukas Heller, who did the screen play of The Dirty Dozen and many other films. Lukas came from the typewriter-and-cigarette generation of writers, and confessed that he amused himself while composing dialogue by choosing words that made the right hand column come out as even as possible...).

You are probably wondering why I am taking you on this trip down memory lane. Well, Borland Sprint, FinalWord and PerfectWriter may all be Norwegian blues, but they are the direct descendants of an awesome text processor that very much lives on. If you installed your Linux from any of the standard distributions like Linux-FT, Slackware or Caldera, you’ll either have it on your hard disk already, or it will be very close at hand. If you’re running AIX,

What's so great about Emacs?

● It's fast and economical on hardware. Because it uses plain ASCII (the X features are something we'll come to later), screens take no time to repaint and (for a slightly different reason) you can move from the top to the bottom of a huge text file in microseconds. It's also fast because it doesn't use a mouse (X features excepted), so your hands stay on the keyboard. This would be a mixed benefit without another important design feature: the Emacs cursor moves not just according to screen geometry, but also understands units of text. Simple keystroke combinations move it forward and back by word, sentence and paragraph. In the hands of an experienced Emacs user this makes navigating and editing very fast indeed.

● Emacs is totally configurable and extensible. I don't just mean that you can remap the keystrokes to match your favourite existing word or text processor — this is a trivial exercise, and one that will turn out to be a waste of time if, like me, Emacs quickly becomes your favourite text processor and you find yourself remapping everything back again in order to remain compliant with the standard. I mean you can change the behaviour of virtually every feature of Emacs, and add features of your own using Emacs Lisp macro language. The version of Emacs I'm using to write this — it comes with Caldera — has already been crazily extended to include Doctor, a variant of the old Eliza program that lets you

switch to another Emacs buffer and engage in dialogue with an electronic psychiatrist, and Spook, a random word generator that creates strings of words intended to alarm the US authorities supposedly monitoring internet email. More usefully, Emacs includes its own mail program and internet news readers, all written as Lisp extensions.

● Emacs is cross-platform. Yes, it's pretty complex to learn (although the built-in help pages and tutorial speed the process considerably), but once you've learnt it you have a set of skills that can pretty well be ported to any environment you can think of. Emacs is everywhere, and for a very good reason....

● Emacs is free. This isn't just a cheapskate attraction: Emacs is philosophically free. It's free of the political machinations of individual companies; it's free from being tied to the fortunes of any particular operating system. It's free (paradoxical thought this), of the onward march of new versions every 18 months that have become the marketing requirement of commercial software, and which cost users much more than just the upgrade fee. Like Linux itself, Emacs is issued under the GNU licence. This isn't just Open software, with that pompous, mendacious capital "O". Unix usefully distinguishes between upper and lower case. Like Linux, Emacs is not Open. It's *open*.

NeXTStep, UnixWare — you name it — a copy of this for your processor and operating system won't be more than a short FTP hop away. Likewise OS/2 and even DOS. As old hands will have realised, I'm talking about Emacs.

Word vs text

What's a word processor? The features that distinguish a word processor from a text processor seem to me to be all about preparing text for printing. I don't know about you, but I don't print anything much these days. Everything I write professionally goes straight down the telephone to people with their own definitive ideas about how the words I write should look in print. Yes, I have been sending stuff down in Microsoft Word format, but my occasional italics and my even rarer use of features like tables have probably hindered rather than helped the sub-editors at the other end.

More on Emacs and word processors next month.

AIX

At the recent IBM Technical Interchange at Disneyland, Paris, Mark Wieland of the Personal Power PC Group gave me a quick trip round the new version of AIX, version 4.1.3 which runs on a PowerSeries 850. I'll be rounding out the full picture of this machine and operating system once IBM manages to deliver the review machine they promised me in March 1985... ho-hum. But here are some introductory thoughts:

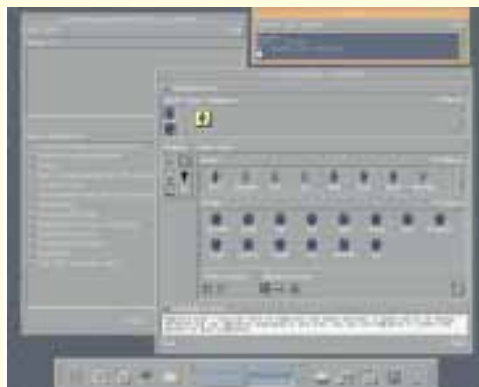
AIX is now (since version 4) a fully multi-threaded implementation of Unix. Version 3 implemented [pthreads], which is library support for threading in the user space only. In version 4, thread support was carried through to the kernel, so that every user thread has a kernel thread to support it. The importance of this is that each thread can now be handled in real-time, and in a multiprocessor AIX machine, different threads can be handed off to different processors.

Since I last looked at AIX, SMIT, AIX's



X-based system management tool, has been supplemented by a new Visual System Manager, VSM, which is activated through drag and drop. If you want to create a new user, it's simple: Pick up a "new user" icon and drop it among the collection of existing user icons. Pick up a password icon and drop that on the new user in order to pop up a dialogue box requesting the new password. And so on. There's a lot to drag and drop to in the CDE, the Common Desktop Environment now finding its way into the operating systems of the major Unix manufacturers. Mark showed me how you drop an Mpeg data file on the Mpeg player to power up the movie, and you can also, of course, open the movie directly by double clicking on the data item.

All this is distinctly old hat, I know, to OS/2 users. Indeed, it's from OS/2 that the technology to do this in AIX is coming, with the difference that the CDE associations between data files, their icons and their executables aren't dynamically established through SOM (System Object Model). Like Caldera's Looking Glass desktop manager, the AIX CDE associations are set up through a data file that you explicitly edit, either directly or via a special editor. CDE includes a floating launch tool very like the OS/2 Launchpad, but again this has to be configured via an editable data file. You can't just drag icons to it the way you can with OS/2.



The AIX Visual System Manager extends System Management Interface Tool with a drag-and-drop interface for tasks like setting up new users. OS/2 users may be wondering about the Launchpad-like bar at the bottom of the screen. This is a standard part of the Common Desktop Environment, and stems from the same Hewlett-Packard user interface technology that inspired Warp's Launchpad

Ironically, SOM is already a part of AIX, and as I understand it there's no reason that the AIX desktop shouldn't be as object-orientated as its OS/2 counterpart. I gather from Mark that this will happen eventually. But at the current pace of AIX development it may not be wise to hold your breath.

Christmas Wishes

This time last year, I drew up a list of goodies I'd like Father Christmas to stuff into my stocking. I wanted Cairo and Taligent, but guessed — rightly, as it turned out — that I'd have to make do with Windows 95 and another bunch of promises. I also wished for some rapid developments on the Linux front that would make the embryo Windows emulator, Wine, able to run a few standard Windows apps like Ameol, Excel and Word. That hasn't happened yet, but somehow I'm not holding my breath, and Linux is progressing fine without it. In the same spirit, I asked for a rather more substantial list of 32-bit apps for OS/2 to run. Again, disappointment. But IBM has promised that the new Windows extensions to the API will now, at last, bring them flooding in. I'll believe that when I see it.

Actually it's not apps I want anymore. I'm now in the mood for components. Deliver, somebody, somewhere, at least some of the promises surrounding OpenDoc. Just enough to get me believing that it's real. At Disneyland, Paris, I saw OpenDoc running on OS/2, and I can't say that the demonstrator was exactly fired with enthusiasm, or brimming with knowledge of the subject. It takes people to make this technology work, and alas real OpenDoc evangelists such as Kurt Piersol, one of the OD architects I met last year, are few and far between.

I also expressed a pious wish that the Unix community would get their act together. COSE, the Common Open Software Environment, is starting to become a fact of life, but in other respects, Unix seems more diffused than ever. SCO now owns the System V strain, which is probably good because they'll know how to sell it, something that totally defeated Novell. But I fear that SCO and AIX and the newly named Digital Unix are now going to be fighting each other rather than pulling together; something that's going to do Windows NT sales no harm at all.



Seminar

Speaking of OS/2, I had a chance to talk to Paul Giangarra, one-time chief architect of OS/2. He told me that it was his second time in Disneyland Paris that year — the previous visit had been as keynote speaker at what turned out to be an AIX seminar.

Closing the DisneyFest was David Barnes, IBM's OS/2 demo god. Personally I find Dave's high octane, joke-packed presentations just a little too shrill, particularly at a time when IBM is supposed to be concentrating on OS/2's corporate credibility.

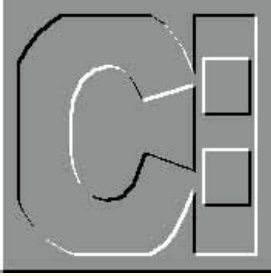
But one message came very clearly through the non-stop patter. He likened the way OS/2 runs multiple 16-bit Windows sessions to a mainframe operating system running virtual machines; "something IBM really knows how to do. Doesn't matter what the operating system is in the virtual machine..." He was talking, of course, about OS/2's potential ability to cope (or not) with future 32-bit Windows applications. "Is our technology built with ones and zeros," he asked rhetorically? "You bet it is. Just like Microsoft's. I can't say definitely that we'll support Windows 95. But if at some time there are compelling applications that our customers tell us they have to run, we can do that."

Incidentally, if any of you are listening to the gossip about IBM downgrading OS/2, or even killing it off, Paul Giangarra is living proof that IBM has no such thing in mind. Yes, it's closing down the Boca Raton OS/2 development in Florida and moving the whole thing to Austin, seat of IBM's AIX development.

Barnes joked that he'd sensed this coming, and made the move a couple of months ahead of time. Giangarra told me afterwards that Barnes's early move wasn't so smart, because it meant he'd missed the relocation package IBM was offering. "They are so serious about continuing with OS/2," said Giangarra, "that they've offered me a fabulous deal to haul up my roots and go to Austin, provided I promise to stay working on OS/2 for the next two years. And that's exactly what I want to do anyway. My wife works for IBM too, and the combined deal means we can go down there and build the house we've always wanted."

PCW Contacts

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Quit or I stop

Simon Collin explains what to do when a database acts up, makes sense of DOS program settings and finds a cunning way of redirecting batch files

I have been trying to get my DOS applications (or rather, one database in particular) to run under Windows 95. The software detects that Windows is running and refuses to continue; displaying an error message telling me to quit from all other applications (ie Windows). Is there any way of getting round this?"

PCW Many disk utilities and low-level products want sole use of the PC. Win95 includes two switches which let you tame DOS programs into working in a controlled Windows environment.

The first hides Windows from DOS programs. The second runs the DOS program in an exclusive mode that ensures no other applications (including Windows application) are running simultaneously.

To access these two switches, highlight the DOS program icon that's being difficult and click the right mouse button to display the program's properties sheet. Select the Program page tab and click on the Advanced button. This Advanced page displays three check-boxes: the last lets you set up a unique environment for this DOS session (covered in previous issues); the first lets you hide the fact that Windows is running from any DOS application that might otherwise object to sharing resources.

To avoid problems in which two programs are running at the same time and possibly interfering, use the third checkbox in its simple mode to ensure that this application is running exclusively on this PC. To maintain exclusivity, select the MS-DOS Mode checkbox and make sure that the "Use current configuration" button is selected.

You can use both these settings to force applications to work with and under Windows, but consider why the application might not want to run with Windows before you use the options. For example, if it is a disk utility and will defrag the disk, it will run into problems since Windows could access its virtual memory disk file during the defrag and crash.

"I'm trying to get to grips with DOS under Windows 95 but am confused by the way my DOS settings are stored. I have read that all Windows settings are stored in a central registry rather than individual PIF or INI files. Is there any way of editing this file to make changes to program settings?"

PCW Win95 stores its settings for DOS and Windows applications in different places. The DOS program settings are stored in the equivalent of PIF files (a text file called APPS.INF). The settings for Windows programs are stored in a central Registry that you cannot edit using a text editor (as you did with INI files).

The APPS.INF file is interesting for DOS users because it acts as a master for all DOS program settings. If you view its contents, you'll see there's a section called [PIF95] which refers to specific DOS settings.

The first lines show: which DOS programs have been set up, their title, icon and extra details. These lines refer to relevant sections later on in the APPS.INF file that give more detailed settings for the particular program.

If you are installing a DOS program and it makes changes to a PIF file, these should be reflected in this settings file: if you are having problems finding a fault or

want to check the program settings, this is the place to look.

"I have been following your example batch files over the past months and would like to try and combine some of the features of each tip. The batch programs are in separate files (as in your examples) so I tried to combine two by using the redirection symbol to send the output of one to be the input of the second. Nothing worked, which I assume is a problem with the redirection. Is there any way of redirecting the output of batch files?"

PCW As you discovered, it's almost impossible to redirect the output from one batch file to the input of another. This is not a problem with standard DOS commands that you can type in at the prompt, but the two exceptions to the rule are batch files and the FOR statement. Neither will work with the redirection symbol >.

To solve the problem you have to use cunning and a peculiar loophole in the DOS operating system: you can redirect the output of the command COMMAND which is normally rarely used and serves to start another copy of the DOS command interpreter. The COMMAND word will run any other command that follows it as if it had been typed at the command prompt. For example, to get a directory listing you could type in:

```
DIR
or
COMMAND/C DIR
```

Both lines will run the DIR command. The difference is that the second is doing so in a separate copy of the command interpreter that is only loaded while DIR is being executed. If you don't use the /C switch, COMMAND will start a second copy of the command interpreter and you will have to remove it manually by typing in EXIT.

The point to this background, is that since COMMAND is a standard DOS command, you can redirect its output. You could use the following line to redirect the output of batch1.bat to be used as the input of batch2.bat.

```
COMMAND/C batch1 > batch2
```

This will solve your problem with multiple batch files and should prove useful if you are experimenting with batch files or the FOR command.

PCW Contacts

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Simplicity itself?

Tim Phillips looks at the pros and cons of Windows vs DOS word processing with special reference to Wordpad. There are lots of lovely macros and a clicking good hint, too.

One of the interesting features of the response to Windows 95 is a growing murmur that our beloved software applications aren't very easy to use after all.

Could this be true? Could it be the case that all the usability testing, all the interface design and all the common

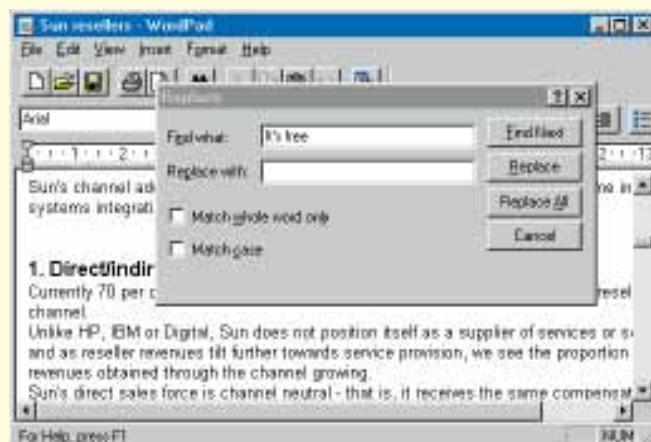
user access standards which we have invested our future in have led to more complex products rather than simpler ones.

I've now decided that actually, DOS word processors aren't a waste of time and simple Windows word processors are even more welcome. Whether or not WordPad falls into that category, you'll have to read on to find out.

Here's a quick refresher on the simplicity debate:

1. A few other people take a pop at Microsoft

Oracle CEO, Larry Ellison, called Windows 95 "ridiculous". He wants to sell a "network computer" which will suck its operating system and applications from a server, using the internet. This will become the *de facto* "home computer" because the PC using Windows 95 is too complicated. Now, if this computer, which has no local storage, is going to suck a word processor into memory, it's unlikely it



WordPad — I'm only half pleased with the lack of functionality here. Any offers for enhancements and hacks gratefully accepted

will be anything as complicated as Word for Windows, is it...?

Ellison is a bit of a "head-the-ball" sometimes, but Oracle is the second largest software company in the world, so he must be doing something right. He has the public backing of Scott McNealy, CEO of workstation vendor Sun, who sees Windows 95 as "a giant hairball", and claims that no one at Sun uses a word processor. "Word processors aren't personal productivity tools, they are personal activity generators", he said while counselling businesses not to buy any new applications; they're already too complicated.

2. A robust defence of DOS

John Hines contacts me via email to make fun of windows users.

"This is being prepared in Autosig, the

DOS freeware comms package, my word processing is done in PC-Write... Why introduce needless delays on working systems? When idiots need drawings of words, Sir... A keyboard-based system has the advantage that it is not necessary to take the hands off to find a mouse and point at some obscure symbol, different in each system, for anyone who's learnt to read."

I cut the most abusive bits, but Mr Hines asserts that: "I can be editing a letter on the Amstrad before my 40MHz 386 has got rid of the hourglass symbol. And then? I cannot type at much better than 30wpm, but the Amstrad can keep up with this."

PC Write is the word processor of choice here: "This has all the features I need for business letters. It will do copy, move, search and replace. It will support macros and I have some for various letterheads. It will include the occasional picture; the amount of wysiwyg is limited and slow, but I think I need pictures only once or twice per thousand letters.

The number of fonts is limited to the number that my printers will do, but so what? ...the cost of my word processing is only just over £5 a year. What would I get for an additional cost of several hundred pounds, apart from looking like just another prat?"

I don't like being called a prat, but there is substance here. If word processing is

Fig 1 Joe Tozer's macro

```
Sub MAIN
  x = Asc(Selection$())
  toggle = FALSE

  If (x >= Asc("A") And x <= Asc("Z")) Then
    x = x + 32
    toggle = TRUE

  ElseIf (x >= Asc("a") And x <= Asc("z")) Then
    x = x - 32
    toggle = TRUE
  EndIf

  If toggle = TRUE Then
    EditClear
    Insert Chr$(x)
  EndIf

End Sub
```

(E.P.J.Tozer, 11th September 1995)

not central to your life, you may be just giving yourself a problem by learning a package like Word or WordPerfect.

3. WordPad: the case for the prosecution

So you want to save money, but too late: you already have Windows 95. What you need is a good free word processor included.

Well, WordPad included with Windows 95, is free at least. Windows 95 users will be disappointed to find that WordPad isn't an improvement on Write. At least it doesn't give us a new file format: instead it uses Write, Rich Text and Word for Windows file formats.

It's great to be able to edit and create

Fig 2



Bart Smit's scrolling macros. I've called the four buttons DOL, UOL, DOB, UOB and clicking them scrolls the two documents simultaneously

The source for the excellent html editor for Notepad. Now let's have one for WordPad, eh?

Word documents, but all the functionality that Microsoft could have put in, yet hasn't, is a real disappointment. A simple html editor and an outliner for a start. There's no macro language as might be expected, but a simple device to create help files would have helped. You can't zoom in and out, although you can print preview. You can also send your memos through electronic mail.

There's nothing intrinsically wrong with WordPad, it's just that Microsoft has made certain that it won't stop anyone buying Word.

4. Someone agrees with me about html, (almost)

I was moved recently to comment that all the sophisticated wysiwyg, html, editing add-ons you get for major word processors just add complexity to a language that is a lot easier than any macro to write. I offered the suggestion that budding html writers should just edit in Write.

"Actually the best editor is not Write but, of course, the ever-present and cuddly Notepad. That was our thoughts when we came up with html Notepad which has all the lovely squidgy bits of Notepad and also does some of that silly html coding.

Have a look at <http://www.u-net.com/virtua/code/htmlnote> you are after version 1.19 for Windows 3.1. A Windows 95 version will be developed as soon as we buy some more memory," says Adam of virtua@cranial.demon.co.uk.

I looked and I was impressed. It's the html editor I was looking for, so have a go yourself.

Tim's macro club

You might have noticed that I am extremely deficient in my mailings to macro club members. I blame the upgrade to Windows 95, but then so is everybody else so I don't expect you to believe me for one minute.

Anyway, by the time I read this my macro club email administration will have been sorted. It's encouraging that despite the lack of proper feedback from myself,

you continue to send in your macros. It's this spirit that made the country great.

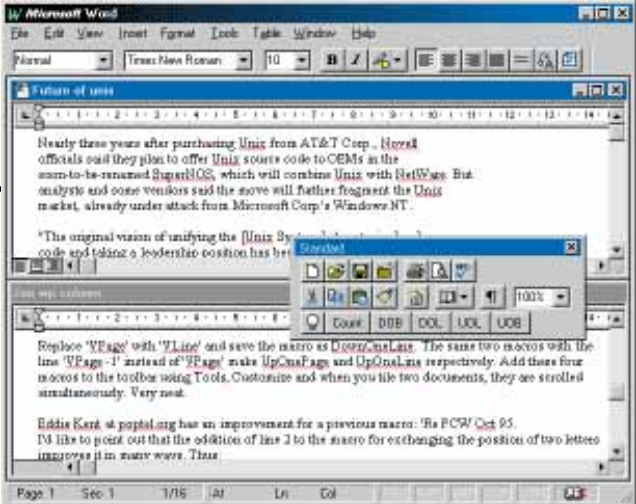
● An example of this pioneer spirit is Joe Tozer, who has put another nail in the coffin of the risible Archimedes (see Fig 1):

"I've just moved over to the PC and Word from the Archimedes and Impression Publisher. I was missing the amazingly handy swap case function, CTRL+S, so have written an ALT+S macro version for Word. It swaps the case of the character to the right of the cursor. Sounds simple but it's much handier than UPPER CASE or lower case or Title Case. Macro swaps the case of the character to the right of the cursor. Use [ALT] + [s] to execute."

● Good one. Now Bart Smit of the republic of Compuserve has solved the scrolling simultaneous Windows problem in Word for Windows: "This is the solution for John Lea's problem, I've written the macros in Word 6.0 but my Hacker's guide to WW2 says they'll work in Word 2.0.

John will have to upgrade to get the custom toolbar, but in the meantime, key combinations will do the trick."

You need four macros called DownOneBlock, UpOneBlock, DownOnePage and UpOnePage (also see Fig 2).



```
This is DownOnePage:
Sub MAIN
ThisWindow = Window()
For i = 1 To CountWindows()
    WindowList i
    VPage
Next i
WindowList ThisWindow
End Sub
```

Replace "VPage" with "VLine" and save the macro as DownOneLine. The same two macros with the line "VPage -1" instead of "VPage" make UpOnePage and UpOneLine respectively.

Add these four macros to the toolbar using Tools, Customise and when you tile two documents, they are scrolled simultaneously. Very neat.

● Eddie Kent at ptepel.org has an improvement for a previous macro: "Re PCW Oct '95 issue, I'd like to point out that the addition of line 2 to the macro for exchanging the position of two letters

Fig 3 Peter Kahrel's macro

```
DISPLAY(Off!)

MakeFileArray( &FileArray )
FOR( t ; 1 ; FileArray[0] )
    FileOpen( FileArray[t] ; WordPerfect_60! )
    DoSomething( )
    ClearDoc
ENDFOR

PROCEDURE MakeFileArray( &FArray )
LOCAL Dlg ; Path ; F ; Count
Path:= ""
DLGCREATE( Dlg ; "Select files" )
DLGCONTROL( CtrlText! ; Path ; "~Filemask: " ; ; ; 30 )
DLGEND
IF( Dlg=-1 OR Path="" ) QUIT ENDIF
DLGINPUT( On! )
FileManagerDlg
Type( Path ) EnterKey
F:=?List-2
IF( F<=0 )
    DLGCREATE( Dlg )
    DLGCONTROL( CtrlLabel! ; "Error: no files found" )
    DLGEND
    QUIT
ELSE
    PosLineDown
    PosLineDown
    FOR( Count ; 1 ; F )
        FArray[Count]:=?Entry
        PosLineDown
    ENDFOR
    FArray[0]:=F
    ExitDlg
ENDIF
DLGINPUT( Off! )
ENDPROC
```

A good clicking

Here's more from my favourite correspondent, Shane Devenshire, who this month has been researching his double-clicks. Someone should give him a column (ha-ha).

These are for Word 6.0, although I tested them with Word 7.0 too:

Double click on:	What you get:
Top of the ruler	Page setup dialogue
Bottom of the ruler	Tabs dialogue
Indent markers	Paragraph dialogue
Title bar	Maximises Word (or restores if already maximised)
Any symbol	Symbols dialogue box
Column separators	Columns dialogue
Left side of status bar	GoTo dialogue
Help icon	Search dialogue

There's loads more too. Try double clicking all over the place in Word. It's alive.

Chris Collins contacts me via Compuserve to offer this advice if you want accented characters, following my Wordstar advice on a macro that's included with the package: "The EXTCHAR macro certainly works, but is so slow as to be unusable for anything but occasional use. No good for linguists! Just try typing an accented character several times at normal typing speed and you'll see what I mean.

"WordPerfect 6 for Windows is much quicker. I've set it up so that Control + character gives grave or cedilla, left hand Alt + character gives acute and right hand Alt + character gives circumflex. I haven't beaten it yet.

"Regressing to DOS (I began wordprocessing with programs called Word Master [editor] and Format [formatter] in CPM) a friend wrote me a very useful little accent routine which was set up by a hot key and executed by typing (say) e and g to get è (grave) and e and a to get é (acute). Much less laborious than the Alt + number combinations I've just used to write this."

I feel a macro coming on...

improves it in many ways. Thus:"

```
Sub MAIN
    CharLeft 2
    CharRight 1, 1
    EditCut
    CharRight 1
    EditPaste
End Sub
```

He's right of course, although "many ways" is probably pushing it a bit on a seven line macro (only kidding, Eddie).

● Proof, if proof were needed, that this country's academic institutions are at least as good as when I was getting a dodgy second from the Victoria University of Manchester, is provided by Lancaster University's Peter Kahrel, who has spotted the fact that Chris McCarthy's search macro is not needed in WordPerfect. (Actually Chris spotted this himself, but Peter beat him to it. I didn't spot it at all).

"The macro that searches text in a directory is not necessary in WordPerfect, since WP has a rather good search facility called QuickFinder. Press F5 (Filelist) then F4 (QuickFinder) and enter the search text. You can specify a directory and limit the file search by date. I think WP Win has a similar feature."

And Peter doubles the number of WordPerfect macros we've run in recent months with this one (see Fig 3): "The procedure MakeFileArray creates an array of

filenames. In the dialogue box you can enter a file mask using the normal DOS wildcards. You can also include a path to create an array of filenames in a different directory than the default one. Make-FileArray's output variable is the array with file names, which you can then process: open the first array element, do something with it, and clear the screen." For this contribution, Peter is this month's champion.

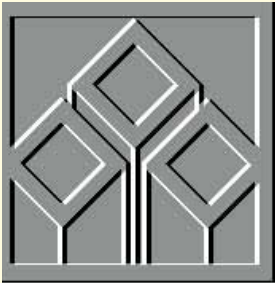
Great work

See you on the net, as they say: if you have a contribution, email it to me. I'm still looking for WordPerfect and Ami Pro macro writers.

Now for the great work that you can all do: I want search and replace routines for entire directories of files — and maybe sub-directories. This is prompted by Richard Eskins of Oldham, who wants to make changes to style tags in all his html pages. I want it, too, for the same reason. You can see how sloppy my html is by accessing <http://www.atlas.co.uk/online/>.

PCW Contacts

And that's that for this month. Surface or airmail to PCW, otherwise I'm on email at wong@cix.compulink.co.uk and CompuServe 100436,3616



And so, to beds

Stephen Wells passes on a reader's spreadsheet which calculates the availability (or lack), of NHS beds which demonstrates how easy it is to create your own Excel Function. Plus more on financial analysis.

Skimming back through my archives, I see that it's been about every five years that I've sprung for a new computer. January '77 was the first. It was a COMPAL, from Computer Power & Light, with 16Kb of RAM. All the software was fed in from a cassette recorder. Spreadsheets hadn't been invented and I used to write accounting programs in BASIC. Most functions could be created using IF statements and GOTO subroutines.

Three computers later, in January '91, I bought a Viglen Genie 386SX with 2Mb

function for calculating that. Thanks to Neil Bain of West Sussex there is. He writes:

"I work in the health service with long-stay patients. We are asked to monitor Occupied Bed Days."

"This involves downloading patient details and calculating how many days in each month they were using a bed. Prior to creating a User Defined Function, the table contained a formula which checked to see if the patients overlapped the month in question and if so, how many days in the month were involved. This required

analysed is entered here in cell four, then dragged to I4 and formatted, mmm-yy. Then highlight this range C4:I4, choose Formula, Define Name and call it Obdm.

The range A5:B8 is formatted, d/m/yy. Then the A column block is named Start, and the B column block, End. These are the dates on which the patient enters and leaves. Incidentally, for administrative purposes the day of arrival (entered in column A) is included as a Bed Day and the day he or she leaves (entered in column B) isn't.

Enter the titles and totals. Save this file as BEDDAYS.XLS, then Open a new file, choosing Macro Sheet. Make the entries shown in Fig 2. Save this as BEDDAYS.XLM.

I've called the new Function, "Bed-Days" and its arguments Start, End and Obdm. This means it looks at the Names which are the same as its arguments and calculates the Occupied Bed Days.

Neil did all the work. The Function looks at the patient's dates of entry and departure, checks whether he or she had arrived in the month above, and if so, how many days of that month the they were there.

To make a listed Function, put the cursor in cell A2 of the macro, choose Formula, Define Name. The cell reference and the new Function Name are entered automatically. Just click the Function option and Add — and the job's done.

Now you can switch over to the worksheet (press Ctrl+F6) and go to cell C5. Then choose Formula, Paste Function, and you'll find your new Function, Bed-Days, both in the All listing and under a new category, User Defined. Select it and press enter, twice. If you follow the example given, you should see 28 in C5. If

Microsoft Excel - BEDDAYS.XLS										
	A	B	C	D	E	F	G	H	I	J
1	Occupied Bed Days by Month									
2										
3	Episode	Episode								
4	Start	End	Jun-95	Jul-95	Aug-95	Sep-95	Oct-95	Nov-95	Dec-95	Total
5	3/6/95	6/8/95	28	31	5					64
6	29/6/95	2/9/95	2	31	31	1				65
7	1/11/95	31/12/95						30	31	61
8	1/6/95	31/12/95	30	31	31	30	31	30	31	214
9		Totals	60	93	67	31	31	60	62	404

Fig 1 Layout of worksheet using a new function to calculate Occupied Bed Days

of RAM and a 40Mb hard disk. I've run every imaginable spreadsheet on this machine, though version 4 of both Excel and Lotus 1-2-3 for Windows are desperately dependent on the swop file. There is no way that it will load Excel 7, and my five years are up again. For what happened next, see "Christmas wishes" (below).

Bed scores

What with all the talk about the unavailability of NHS beds on the wards, you'd think there would be a spreadsheet

multiple-nested IF statements. I have reduced the individual formulas to OBD(Episode_Start,Episode_End,Obd_Month)." Neil's worksheet is shown in Fig 1.

I assume Neil is using Excel 5, because he provided a VBA listing (Visual Basic for Applications). As I know from my mailbag that many readers use Excel 4, and as an Excel 4 macro can be used in later versions, I've rewritten his contribution, see Fig 2. But Neil deserves a £20 book token for his effort, which gives me the opportunity to demonstrate how easy it is to create your own Excel Function.

To make an example, enter the worksheet in Fig 1. The first month to be

Fig 2

Listing for the macro which creates the BedDays function:

2	BedDays	Function
3	=RESULT(1)	Answer is a number
4	=ARGUMENT("Start",1)	Episode start date
5	=ARGUMENT("End",1)	Episode end date
6	=ARGUMENT("Obdm",1)	Particular month
7	OBD=0	Zero out answer
8	MS=DATE(YEAR(Obdm),MONTH(Obdm),1)	Day 1 of month
9	=IF(MONTH(Obdm)<>12)	
10	ME=DATE(YEAR(Obdm),MONTH(Obdm)+1,1)-1	Last day of month
11	=ELSE()	
12	ME=DATE(YEAR(Obdm)+1,1,1)-1	If last month of year
13	=END.IF()	
14	=IF(Start>MS)	Choose start date
15	OBD=Start	
16	=ELSE()	
17	OBD=MS	
18	=END.IF()	
19	=IF(End<ME)	Choose end date
20	OBD=End	
21	=ELSE()	
22	OBD=ME+1	
23	=END.IF()	
24	=IF(OR(End<MS,Start>=ME))	Calculate bed days
25	OBD=06	
27	OBD=OBD-OBD	
28	=END.IF()	
29	=RETURN(OBD)	Go to worksheet

you don't, switch back to the macro and press Ctrl+` (the key to the left of numeral 1). In every working cell of the macro, from A3 down to A29, you should see the word, TRUE. If you don't, something has been entered incorrectly.

Once you see 28 in cell C5 of the worksheet, drag that entry across the full range to I8. You should now show the other results given in Fig 1.

A happy new year

David Carpenter of Norbury is asking for a macro to make a column-moving change, so that a new year's data can be added. Personally, I'd save any five-year financial

analyses you've made, with hard copies and on disk. Then I'd make another five-year form. As it's so easy, and you only need do it once a year, it hardly seems worth writing and debugging a macro.

Let's use the template David was interested in; the one for service companies. To change all the dates, just change the most recent year in cell B1, then all the dates in rows 1, 34, 68, 76 and 83 will correct themselves. Then copy and paste the Accounts Receivable (debtors) figure from F4 to G4. Copy the block B3:E28 temporarily to the block starting H3. Clear the entry range, C3:F28. Then copy and paste the temporary block H3:K28 back (into

EXCELent shortcuts and longshots

- BACK UP Choose Save As, Options and check Create Backup File. Then at each Save the older version will be saved under the file name with a .BAK extension.
- CHECK UP To see details of your Excel setup and its environment, run the macro, CHECKUP.XLM in the excel\library\checkup directory.
- COCK UP If you get in a complete muddle, save your work under another name then open the last version again.
- DOUBLE UP Many Excel icons serve double duty. Hold the Shift key when you click on them and they change their picture and their actions. For example, the Print icon changes to the Print Preview icon.
- OPEN UP Press Alt Gr + F1 (or Ctrl + F11) to open a new macro sheet.
- SPEED UP With a large workbook, choose Options, Calculation, Manual (instead of the default, Automatic). You can still check the Recalculate Before Save button. At other times, recalculate with F9 (or Ctrl +=).



Microsoft Excel - SERVICE.XLS									
	File	Edit	Formula	Format	Data	Options	Macro	Window	Help
	A	B	C	D	E	F	G		
59									
60	PROFITABILITY (%)								
61	Operating Ratio	15.93	15.97	9.94	10.10	11.92			
62	Profit Margin	7.28	6.08	4.37	4.36	5.52	4.10		
63	Return on Assets	6.05	4.86	3.82	3.94	4.08	8.80		
64	Return on Equity	27.75	17.95	10.68	12.22	13.30	20.50		
65									
66									

C3:F28). Now everything's set and ready to enter the new year's figures in column B.

Financial analysis

This month I'm looking at the profitability ratios for service companies.

The results produced from the example figures of an advertising agency which we have been using are shown in Fig 3. A listing for the four ratios is shown in Fig 4. Column B is replicated across to column F. Column G has manually-entered industry averages.

I would restate that the ratios produced by this template should be examined for trends and also compared with others in the same industry, if available.

Referral to a high ratio here means that it is higher than the median ratio for the industry, or a trend to a higher ratio over the five years of the business's activities. A low ratio means lower than average for the industry or the business.

The Operating Ratio can be defined as that portion of the Commissions and Fees income remaining after overheads have been deducted. Interest charges and taxes on company income are excluded, since rates for these two items are beyond the control of management. It is a good gauge of management's competence in controlling costs.

To summarise: £1 less this ratio shows the number of pence taken to generate £1 of sales. That means that if this ratio is 15.93 percent (see cell B61 in Fig 3) then it's taking 84.07 pence to make a £ of sales. It also means that 84.07 pence of each sales £ was absorbed by the operations of the company.

Fig 4

Listing for the profitability ratios section of the financial analysis template	
A60	PROFITABILITY (%)
A61	Operating Ratio
B61	=Operating_Profit/Commission___Fees*100
A62	Profit Margin
B62	=Net_Income/Commission___Fees*100
A63	Return on Assets
B63	=Net_Income/Total_Assets*100
A64	Return on Equity
B64	=Net_Income/Net_Worth*100

Profit Margin is the best-known ratio, comparing Net Income with Commissions and Fees. A high percentage over the years shows that the company has learnt how to withstand adverse conditions like reduction of charges, rising costs or declining sales. Any one of these setbacks can occur, but good managers will take the actions necessary to protect the bottom line and maintain profit margins.

If this ratio is lower than or inconsistent with, the industry average, there will be less profit to pay out in dividends to the owners and to invest for the future.

However, the value of sales and total capital employed must also be taken into consideration. A low rate of return, accompanied by a large sales volume may produce satisfactory results.

Don't think this is a foolproof yardstick — it's only one measure of the profitability of a business. It does however, incitate the effectiveness of management and operation's efficiency.

A high percentage Return on Assets suggests that management is using the company's assets efficiently. A low return may indicate that the company is not being run as well as it should be.

To summarise: The ratio measures the profitability of the company expressed as a rate of return on total investments by both the stockholders and creditors. It shows the number of pence being earned by the company for every pound invested by both interests.

A high Return on Equity indicates that the company offers a good investment for stockholders and that the owners are getting a fair compensation for their risk.

If the Return on Equity is below that of other companies in the industry, you might want to look into the factors behind this. New policies may be required which will either raise charges or reduce costs.

Increased sales of more profitable services or reduction of overheads — or both — can help to raise the return.

The Return on Equity is a

Fig 3 Example results for the Profitability Ratios on the template for service companies

measure of the owners', partners' or stockholders' rate of return on their investments. It is the "yield" or "interest rate" that the business is earning.

If you've sent for the template on disk, you'll find that (ignoring the list of Names at the end) it continues to row 88. The remaining rows offer you the opportunity to make three more charts which don't illustrate ratios. They show the company's five-year report of Assets; Debt and Equity; and Costs, Expenses and Income.

Christmas wishes

Last year, I asked Santa for "a Pentium 90 with all the trimmings, like loads of memory, a CD-ROM and a fax card" which now, a year later, is pretty standard. As time passed and Santa didn't oblige, a month ago I ordered the system from one of the best known direct suppliers, and yesterday UPS delivered it to my door.



Ironically, the hold up had been that they were waiting for fax/modem cards. Whatever next — Marks and Sparks running out of knickers? Maybe so many people want to get on the internet that the world is suffering a modem shortage?

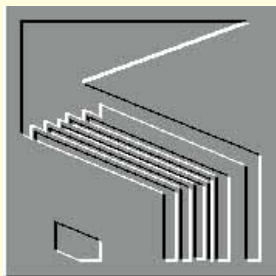
I'm reluctant to tell you the supplier's name (although I'm overjoyed with my new system) as you will think that I got a discount. To maintain my integrity and —more to the point — because they laughed when I asked, I didn't. But who cares? This dream machine is faster, cooler, quieter than my previous rig. The documentation is excellent. Everything was set up and ready to go. With no experience of comms, I signed up to the MS Network with a local connection from the keyboard.

This year Santa? I'm content. But you're welcome to drop in for a sherry.

PCW Contacts

Stephen Wells welcomes comments on spreadsheets and solutions to be shared. Send them to PCW Editorial at the usual address or at **Stephen.Wells@msn.com**.

For the financial analysis Excel templates for service companies and those which carry stock, send a formatted 3.5in disk and a stamped, self-addressed envelope.



The Perfect Gift

A chastened Mark Whitehorn eats more humble pie than mince pie, and asks: "What do database developers *really* want for Christmas?" Plus, using the Count function, and more lottery logic.

OK Santa, I am a humbled and chastened individual. Last year I was greedy: you know it and now I know it. I got carried away. I asked for a powerful workstation, a big file server, and an even bigger database server. Then I added a new network to the list, and finally a new house in which to keep it all. I was too greedy and, quite rightly, nothing appeared on Christmas Morn. Not so much as a mouse mat with a picture of a penguin.

I realise now that I was foolish and self-centred. There are far more deserving causes than my own self gratification, so this year I'll ask for things from which we can all benefit.

For a while now I have been covering those features which make a DBMS actually Relational (in other words, make it worthy of the term RDBMS). As I have been doing this, it has come home to me more forcefully than ever that the majority of DBMSs sold for the PC simply don't make the grade. This isn't a question of simple pedantry, or an insistence that definitions are met; it's about wanting DBMSs that actually deliver data security, speed and ease of use. I would be grateful if, over the next year, you could make all the manufacturers look seriously at their products, and either remove the word "Relational" from the box or deliver the goods. If you need a few names

of offending manufacturers, try IBM (Approach), Borland (Paradox, dBASE) and Microsoft (FoxPro).

Secondly, we (database developers) need more tools. Santa, you have no idea what it is like nowadays. Gone are the days when we could ask for, and get, a whole year in which to fail to deliver a complete database. Two-year extensions on projects which were originally scheduled for a mere six months are no longer the norm. Nowadays we are sometimes expected to deliver working systems within a few paltry months. I have even heard of projects with detailed specifications and, almost unbelievably, penalty clauses.

What we really need are more tools to take the slog out of the design and implementation work. After all, while much of our work is, of course, an art form and could never be replaced by a mere computer program, much of it is essentially a slog. With those bits we could really do with some help.

Access 95's new database designer is a step in the right direction, and of course Asymetrix's Info-Modeler, SDP's S-Designor Professional are doing a great job, but we need more. We also need these tools to be more tightly integrated into the RDBMSs that we use on a daily basis. Anything you could do in this direction would be greatly appreciated.

Well, that about wraps it up for the present (sorry, about the pun) I hope that Ms Claus, and all of the little sub-Clauses, are fine.

Regards,
Mark.

Fig 1 John S.Graham's sample code

```
Sub Form_Current ()
    'The ComboBox is called "Pick List"
    'The form is called "Employees"

    Dim ctlPickList As Control
    Dim rstEmployees As Recordset
    Dim rstEmployeesClone As Recordset
    Dim strName As String
    Dim intRow As Integer

    Set rstEmployees = Me.RecordsetClone
    rstEmployees.Bookmark = Me.Bookmark

    rstEmployees.MovePrevious
    If rstEmployees.BOF Then
        GoTo AtFirstRow
    End If

    Set rstEmployeesClone = rstEmployees.Clone()
    rstEmployeesClone.Bookmark = rstEmployees.Bookmark

    intRow = 0
    Do Until rstEmployeesClone.BOF
        rstEmployeesClone.MovePrevious
        intRow = intRow + 1
    Loop

    strName = [Pick List].ItemData(intRow)
    [Pick List].Value = strName

    rstEmployees.Close
    rstEmployeesClone.Close

Exit Sub

AtFirstRow:
    strName = [Pick List].ItemData(0)
    [Pick List].Value = strName
Exit Sub

End Sub

Sub Form_Load ()
    'Sets the default value for the combo when the form loads

    Dim strName As String

    strName = [Pick List].ItemData(0)
    [Pick List].DefaultValue = strName

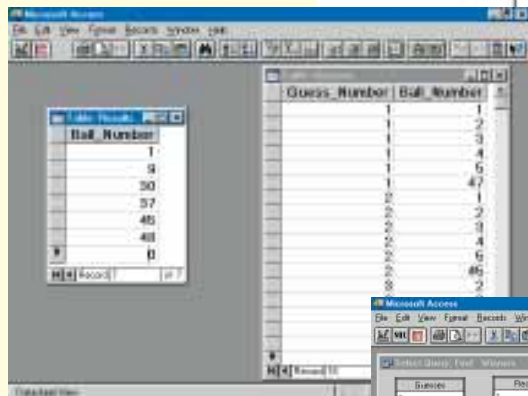
End Sub
```

Tips and tricks

Well, I asked for tips and tricks and here is some code sample from John S. Graham: "How do you feel about covering the elements of DAO in future

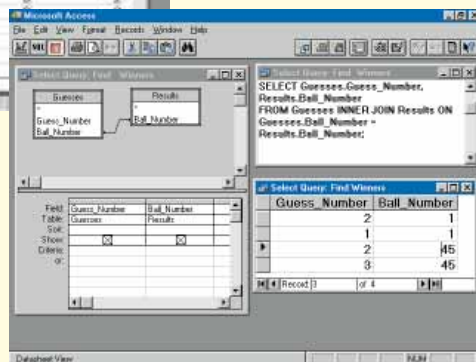
Fig 2 Lottery solutions

Right Access unable to swallow a complex SQL command

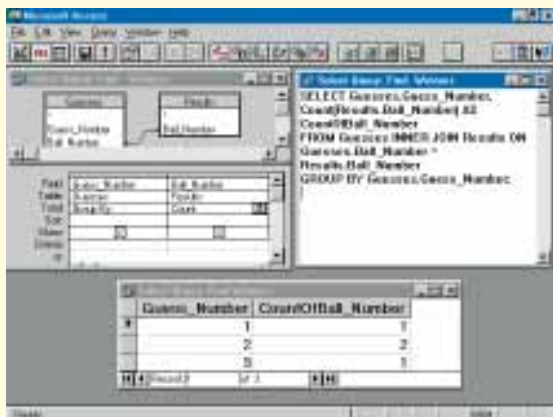


Left The tables used in Chris May's solution to the lottery problem

Right A simple query to find matches between the guesses and the winning numbers. The Access GUI, SQL and answer table shown are all from the same query



Left The final, desired result



articles?" (Sounds like a good idea to me. MW).

"I have some sample code that illustrates how to use complex things like BookMarks and Recordset Clones. This code is attached to the 'Current' event of a bound form which is the container object for a ComboBox. The ComboBox draws its data from the same query as the form and its main purpose is to move the form to a record corresponding to the value selected in the combo. This is trivial

stuff, as the code to do it is in the Access Help file. However, if the combo displays a value and the user moves to a different record (using the form navigation buttons), the value in the combo remains static and does not follow the form. My code corrects this so that the combo 'follows the form' in addition to the form 'following the combo'." (See John's sample code in Fig 1)

● And from Bob McQuattie: "Before identifying my problem, could I also add to the article in October's PCW" (in which I



Fig 3 Roger Hipperson's SQL query

```

SELECT DISTINCTROW
iif((select ans1 from lotteryanswer)=lot1,1,iif((select ans1 from lotteryanswer)=lot2,1,
iif((select ans1 from lotteryanswer)=lot3,1,iif((select ans1 from lotteryanswer)=lot4,1,
iif((select ans1 from lotteryanswer)=lot5,1,iif((select ans1 from lotteryanswer)=lot6,1,0)))))) +
iif((select ans2 from lotteryanswer)=lot1,1,iif((select ans2 from lotteryanswer)=lot2,1,
iif((select ans2 from lotteryanswer)=lot3,1,iif((select ans2 from lotteryanswer)=lot4,1,
iif((select ans2 from lotteryanswer)=lot5,1,iif((select ans2 from lotteryanswer)=lot6,1,0)))))) +
iif((select ans3 from lotteryanswer)=lot1,1,iif((select ans3 from lotteryanswer)=lot2,1,
iif((select ans3 from lotteryanswer)=lot3,1,iif((select ans3 from lotteryanswer)=lot4,1,
iif((select ans3 from lotteryanswer)=lot5,1,iif((select ans3 from lotteryanswer)=lot6,1,0)))))) +
iif((select ans4 from lotteryanswer)=lot1,1,iif((select ans4 from lotteryanswer)=lot2,1,
iif((select ans4 from lotteryanswer)=lot3,1,iif((select ans4 from lotteryanswer)=lot4,1,
iif((select ans4 from lotteryanswer)=lot5,1,iif((select ans4 from lotteryanswer)=lot6,1,0)))))) +
iif((select ans5 from lotteryanswer)=lot1,1,iif((select ans5 from lotteryanswer)=lot2,1,
iif((select ans5 from lotteryanswer)=lot3,1,iif((select ans5 from lotteryanswer)=lot4,1,
iif((select ans5 from lotteryanswer)=lot5,1,iif((select ans5 from lotteryanswer)=lot6,1,0)))))) +
iif((select ans6 from lotteryanswer)=lot1,1,iif((select ans6 from lotteryanswer)=lot2,1,
iif((select ans6 from lotteryanswer)=lot3,1,iif((select ans6 from lotteryanswer)=lot4,1,
iif((select ans6 from lotteryanswer)=lot5,1,iif((select ans6 from lotteryanswer)=lot6,1,0))))))
AS count FROM LOTTERY;

```

talked about the problems of installing Access as a network application. MW).

"1. We have installed Access 2.0 on individual networked PCs, with the database stored on the server. During development, only one machine was accessing this, so no problems. However, once we tried to go live, we found that messages were coming back advising that the database was already in use. We had omitted to amend the default access to "shared" rather than exclusive. A simple solution, but one which can drive you mad until you find the answer.

2. The article on modifying forms, etc made reference to "cut and paste" to a modified form. I would have thought that the simpler solution would be to open the original form, and then "save As", giving a modified form name; this can then be used for further changes without disturbing the original. Or have I missed something?

No, Windows often provides several ways of doing thing, these are just two alternatives. I find the Cut and Paste solution (especially with Ctrl C and Ctrl V), to be slightly faster, but it's just a matter of taste.

3. My problem. My database contains records which are extracted for the purpose of producing labels, for product certification. Within each batch of line items, there can be a variable number of labels per line item. I have now managed to construct the necessary form and print routines to produce the required number of labels. These are sent, via the server, to an Epson FX1170 Dot matrix printer, and printed two-across.

However, different customers take different labels, and while there is a marginal

difference in width, the problem stems from the length of the label. My labels form was originally designed around a label length of 1020mm although only approx. 800 mm is used (there is a pre-printed company logo). This label is, to all intents, satisfactory.

However, when I try to alter the settings to the other label length of 860mm, these changes being made in both Control Panel and Print setup, the label form becomes misaligned due to spacing up more than required, and seems to have a distance of 1020 mm between the first line of print on consecutive labels. Try as I might, I cannot find any reason for this spacing, as all the settings seem to be correct. Can you make any suggestion?"

The simple answer is no, apart from questioning the overall efficiency of the printer driver. Has anyone else come across this problem?

● In the Nov. issue of PCW I published a lottery problem from Mark Broadbent. I supplied a solution in code, but wondered if anyone could come up with a solution which consisted of a single query.

Roger Hipperson replied: "Here is the (unpleasant) SQL query to check the rows of numbers in lottery against the ONE row of results in a table called lotteryanswer," shown in Fig 3. It is enough to make you want to do the lottery.

Nothing would induce me to do the lottery (except of course the thought of all the money). I tried to insert this SQL statement into Access and it replied succinctly (see Fig 2) but I am more than prepared to take Roger's word for its accuracy. He is, however, quite correct that it is unpleasant.

● A different solution came from Chris May: "I think your lottery SQL problem in the current PCW is more of a database design problem than an SQL one. If you simplify (normalise) the tables a bit more by making each ball prediction and result a row in its own right, you can just join the guesses and results tables on ball number and use "count(*)" and "group by" to find how many guesses match the results.

Here's the example, using your data:

```

select guess_number,
count(*) as matching_balls
from guesses, results
where guesses.ball_number
= results.ball_number
group by guess_number."

```

And Chris supplied the appropriate tables. This solution clearly comes from an RDBMS other than Access (Ingress, in fact), since the SQL syntax is different. It can be converted to the standard Access dialect as:

```

SELECT DISTINCTROW Guesses.Guess_Num-
ber, Count(Results.Ball_Number) AS
CountOfBall_Number
FROM Guesses INNER JOIN Results ON
Guesses.Ball_Number =
Results.Ball_Number
GROUP BY Guesses.Guess_Number;

```

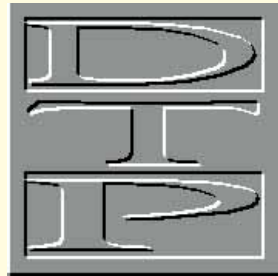
The burning question is "How does it work?". We start with two tables, "Results", which holds this weeks results from the Lottery, and "Guesses" which contains three guesses that we have made. These tables hold the same data as used in the November issue, it has simply been redistributed (see Fig 2).

A simply query can be used to find which numbers from the Results table are also found in the Guesses table (see Fig 2). Each time a match is found for a particular guess, a new record appears in the answer table. Thus we see two matches for guess 2, and one each for the other two.

Finally, all we have to do is to count the number of matches for each guess and we have accomplished the task (see Fig 2). I like this solution because it seems cleaner and more elegant that the one I originally suggested.

PCW Contacts

Mark Whitehorn welcomes readers' correspondence and ideas for the Databases column. He's on m.whitehorn@dundee.ac.uk



So, dear Santa...



That time of year has come when Gordon Laing's wishful thoughts turn to all things Christmassy. But what you want is not always what you get, he says. Looks like he might have to make do with some festive fonts.

It's Christmas time again in the merry land of Graphics and DTP. To be honest, I'm writing this in early October and the weather's just beginning to turn chilly, but I love the festive period and start dreaming of snowflakes and the spoils of the season shortly after my birthday in the height of summer.

Last year, I persuaded the *Hands On* contributors to write a festive wish list, and even though this section's responsibility has long since changed hands, the sentiment still remains. So please indulge me for a few columns as I rant and hopefully reason, but there'll be some space remaining for some serious festive fun: I've certainly got a couple of groovy, or should that be funky, fonts for your perusal.

Christmas Wishes

I had a look over my wishes for last year, and funnily enough I'm still after the same things — admittedly more of them or bigger, faster versions — but the same principles. I suppose at least I'm consistent in my desires and the industry is consistent in not fulfilling them.

So, dear Santa...

1. More RAM. My number one wish last year was more RAM, and unsurprisingly the desire remains.

A year ago I upgraded from eight to 16Mb, and the difference was phenomenal. Windows 95 really loves those additional 8Mb, transforming a sluggish machine into one that feels

perfectly happy. At home, I have a 486DX4/100 with 16Mb and a PCI bus which runs Windows 95; doing its day-to-day housekeeping as fast as my P90 at work. Extra RAM refreshes the parts that many companies claim only a processor upgrade can. So where to go from 16Mb?

The obvious answer is 32Mb, and recently I was lucky enough to use a Power Macintosh 8100/80 with that amount. I thought it would only make a difference when working on particularly large graphics files, but I was surprised to see how much faster the system ran overall.

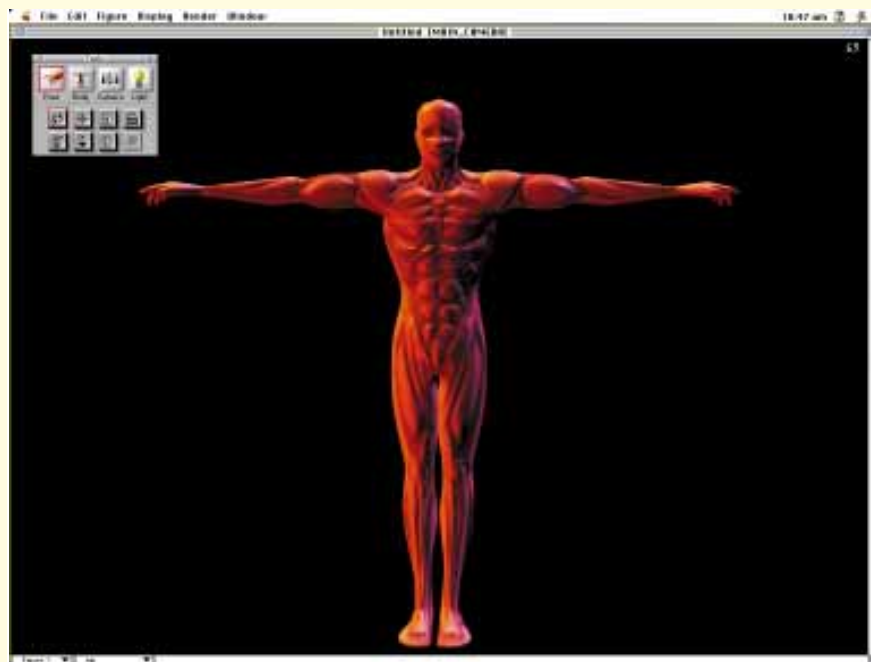
Different operating systems handle extra RAM in different ways, as do certain motherboards, but for an overall boost to your system, try fitting more RAM.

2. Windows wishes. Windows, particularly number 95, is a subject for several more wishes, so let's start getting them out the way now.

However much I love Macintosh, I still want to see more graphics developments on the PC. We've had Quark XPress, Adobe Photoshop, PageMaker (now under the Adobe wing), and FreeHand for Windows matching new Macintosh releases sooner or later, but that's where it all grinds to a halt.

The trouble is that you need all the little utilities and extensions as well. Adobe Dimensions and Fractal Designs Poser are two applications I would love to see on the PC. That's not to say that similar or, in some cases, better apps are not available under Windows, but it's nice to see some familiar faces and perhaps a little

Fractal's wonderful Poser, sadly a Macintosh-only product. Let's have more of this sort of thing for Windows, please



Ho ho ho



Hopefully this won't frighten too many young children... I've finally got around to designing my own Christmas card which you can see here. I must admit to being inspired by a few fifties kitsch cards I saw in the shops recently, but a little plagiarism is no bad thing. The original festive photograph is myself many years ago, a little the worse for wear at a university ball — the hat was sadly not added later. I scanned the original into Photoshop, cut out the edges, placed it on a rusty red background and added a feathered border; an effect I'd seen used before. All the objects scattered around are real — the holly, tinsel and baubles were placed directly on the scanner, and the beers taken from magazine shots. All were arranged using layers, then the type (Tape-Type) added in FreeHand, converted to curves and placed on top of the final, merged TIFF in Quark XPress — Merry Christmas.



cross-platform compatibility. Which leads me neatly onto the next wish.

3. I wish... This really is pie in the sky stuff — I'm talking about seamless cross-platform file exchange. Latest versions of XPress, PageMaker, Photoshop and FreeHand quite happily open documents created on another platform, but with varying degrees of success.

The first hurdle to overcome is file naming conventions. Up until Windows 95, PC users were limited to 8.3 file names and Mac users would laugh at the inadequacies. Going from Mac to PC the latter users would only see the first eight characters; often not giving much clue as to the file's identity. Windows 95 is not much better across platforms unless you use an NT server in between (or so I'm told).

Once you've worked out which is your desired file from a few nondescript characters, your problems are either over or they have only just begun. In the case of bitmap files, going from Windows files to Macintosh and vice-versa is pretty much foolproof. Even Photoshop 3 PSD files with multiple layers open seamlessly from one platform to the other.

The files that are problematic are the ones with fonts in them: most commonly DTP and drawing packages. Normally these files contain pointers to the font

outline files and instructions on what to do with them, such as: "put these words this big, over here, in this colour, and use this font which you can find in this folder".

It's when you try to open these files on a different machine or platform that you get into difficulty. Either they don't have the fonts installed, or else they have something similar enough to get away with, but differently named. The result is a substitution which causes reflowing and completely messes up your design.

Dear Santa, please sort this out for me. Alternatively, I'll have a good old think, talk to some so-called experts and write a column about this infamous topic in the very near future.

4. And another: Here's a good one: a new version of Adobe Illustrator for Win-

Quark's official internet web site, complete with updater files for the latest revisions; one of them's bound to work

dows. Missing — presumed dropped for good. At least let us know what's going on, Adobe. Oh, and how about totally bug-free versions of CorelDraw in the future — dream on.





It's a Photoshop fake — Seriously though, wouldn't Windows 95 be so much better if thumbnails were used for graphic file icons like the Macintosh?

5. Quark. This one's even less likely: review copies of Quark XPress and a little bit of friendly UK Quark PR... No, that's ridiculous. How about a working copy of XPress 3.3, on either platform? — Hmmn still extremely unlikely.

In fairness to Quark US, I had a fairly positive internet experience lately. I had vanilla XPress 3.3 for Windows, which failed to work post Windows 95 installation — imagine my surprise. I tried several third party internet ftp sites offering so-called revision updates, but none worked. Then very recently, Quark opened its official web pages, complete with downloadable updates. Within minutes, I had updated to 3.31 revision 5, working rather quickly under 95, but no long filenames yet.

Quark's website also had email technical support. I emailed a question about my 95 problems and got a reply by return of bytes — very helpful, friendly, and hopefully the way forward for Quark. I speculated last year that it would be able to purchase FreeHand, which it didn't, and the bitmap retouching XPosure hasn't turned up on my desk yet, so for the moment, Quark has to ensure the XPress user base is happy.

6. Thumbnails. Still on Windows 95 and equally unlikely to happen, but thumbnail icons for graphics files would really be a touch. A few months ago, I mentioned this and illustrated my point with a Macintosh window to show how it should be done. In

Fonts of the month come from Swifty Typographics; also responsible for this record sleeve, designed by Ian Wright

temporary defeat, I commented that the Quick-View feature of Windows 95 was a fair compromise, but ironically its graphic capabilities appear to have disappeared on the final release.

Many people kindly wrote or emailed me to explain how thumbnails can be created for BMP files, but what we really want is a solution for *all* file types. Hopefully, Adobe may implement this in the next version of Photoshop, or perhaps even Microsoft may have

plans for Windows 96: 2096 that is.

7. Suitable receivers. Back to the dual or multi-platform problems. I'm lucky enough to have a PC and a Macintosh on my desk; both connected to the same, wonderful, Taxan 2100LR monitor which boasts dual inputs. I simply press a button on the front panel to switch between operating systems. Oh, and one small thing I forgot to mention — I also have to swap keyboards, mice, and double up every other peripheral.

Apple kind of solved this problem with

its DOS card for a couple of selected Macs. The card boasted a 486 processor but shared every other resource including monitor, CD-ROM drive, network connection, keyboard (and using the Apple extended keyboard under DOS and Windows was such a treat), mouse, and so on.

I realise that there are separate connections on a PC for the mouse and keyboard, while the Apple ADB system daisy chains all to one socket, but it would be so nice if there were some way around this sharing problem. We've seen some really neat infra-red keyboards and pointing devices; perhaps the PC and Mac could have suitable receivers, each for a single input device. And let's make them decent ergonomic devices too.

Apple's asking price for its extended keyboard may seem like extortion but it really is so much better than any other I have ever used — I wish I had one with a PC plug on the end.

8. Storage: that place you, er, store things. That place which fills up at a frightening rate. Yes, I wish I had more of it. Fortunately this *is* an affordable wish.

Hard disk prices are dropping at an incredible rate and are getting faster and faster. Numerous removable, re-recordable devices are fighting it out for mass acceptance (see last month's round-up), and while none have been universally

chosen as standard, at least this competition has driven prices right down.

Even CD writers have finally broken the grand barrier. Hewlett-Packard's Sure-Store 4020i comes complete with software and SCSI card for just over £800 — remarkable, and reviewed in this issue's *First Impressions*.

Oh, one last thing: how about some miraculous CD-ROM drive which can open the biggest PhotoCD file in a few seconds? Impossible I'm afraid, since the encoding used by Kodak appears to slow the opening of images to nothing faster than quad speed. Bah.

9. Best resolution. Whoops, it's inevitably back to our old friend Windows 95 once more. Windows 95 is a remarkable product in that it manages to turn what used to be the most difficult tasks into a doddle to set up — but in return sometimes makes the easy ones a nightmare.

I'm talking about graphics card drivers, which, to be fair, weren't *that* straightforward under any other version of Windows. My ninth Christmas wish was to have at least all the common video drivers sorted out in time for the autumn release of '95, but since that has passed, I'll make do with the very near future. In the meantime, many users have been forced back to working in VGA, or SVGA, when they've got hardware capable of so much more.

That's another wish by the way, that all computer suppliers set their machines up to run at the best resolution the supplied monitor will accept. So many get shipped out with decent 2Mb cards and capable monitors, yet are set up to run at VGA — and that really annoys me.

And while I'm having a gripe — here is a bugbear that has echoed back and forth across the hallowed walls of PCW, many other offices throughout the company (and in fact most of the rest of the world judging by the amount of mail I've had on the subject). Diamond Stealth 64 is probably one of the most common video cards available, and one of the weirdest to currently get working under Windows 95.

I ended up getting the answers from one of Diamond's pages on the internet, but the gist was that Windows 95 guessed the type of chipset incorrectly. Oh, and you also have to run a little DOS program every time you boot up — obvious really.

Fonts of the Month

DOLCE VITA

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ&1234567890

Miles Ahead

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz&1234567890

10. Books. One thing I always loved about Christmas were all the little goodies (oh no, I'm not shallow or missing the point), so here's the latest crop to catch my eye.

Books are always wonderful gifts, and in the field of design there are loads. Font fanatics should definitely have a comprehensive type bible, such as my favourites: Agfa's *Type Reference Book*, or FontWork's *FontBook*.

Also recommended, for a bit of history and background, are Lund Humphries' *Typographers on Type* and *Twentieth Century Type Designers*.

Techies could go for encyclopedias of graphics file formats or PostScript code reference books to

while away the long winter nights.

Beginners should take a look at the numerous guide books like the "... for Dummies" series, from IDG books.

Fonts are always a good bet. Enthusiasts should call FontWorks for details on the fabulous FUSE issues, each with a disk of innovative typefaces and a poster of information; now available for both Mac and PC platforms

Font of the month

A few months back, Swifty's Funky Fonts caught my eye. I eventually got hold of the

pack called Command [z], which features two fonts designed by Ian Swift, (aka "Swifty"). The two faces, Dolce Vita and Miles Ahead are this month's Fonts of the Month. Swifty's Funky Fonts cost £30.50 and are accompanied by a beautifully produced booklet. They're Mac only now, but a PC version is hoped for in the new year.

Swifty and several other designers make up Swifty Typographics, responsible for loads of excellent work, including much for the Talkin' Loud record label. I'm a big fan of Talkin' Loud and sorted through my records to find a good example of their work. The sleeve reproduced here is for the Incognito cover of "Don't you worry 'bout a thing", released in 1992, and designed by Ian Wright.

Here's a final bonus wish: I wish Apple the best of luck in 1996.

PCW Contacts

I wish you all a merry Christmas, happy New Year, and hope that many of your wishes come true. Feel free to send greetings cards to the PCW address on Broadwick Street or email me as gordon_laing@pcw.ccmil.com.

compuserve.com
Faces 01276 38888
FontWorks 0171 490 5390
Adobe 0181 606 4000
Paul Tully (for Swifty) 0171 729 3003
Quark home pages
<http://www.quark.com/>
Diamond page
<http://www.diamondmm.com/win95.html>



Multimedia Presentation

The visual glitter of multimedia makes it an obvious choice for the festive season. Panicos Georgiades and Gabriel Jacobs look at some of the best Christmas gift material, from 3D packages to a multimedia tutorial.

There's at least one thing that Christmas and multimedia have in common and that's razzmatazz — lights, sounds and pictures. There are other similarities too; they're both concerned with delivering messages. Christmas (supposedly) delivers the word of God, multimedia (and this is certain) delivers the word of anyone with enough money to develop and market a title. Furthermore, Christianity changed the world — many people say that multimedia will do the same.

But before we take the religion/technology analogy too far, let us not forget the biggest similarity: both multimedia and Christmas are big business, and we the public are stuck in the middle. At Christmas time, we're under pressure to buy presents, and multimedia products make very good Christmas presents. So we've decided this time to devote most of our column to ideas for multimedia presents for the festive season.

Get me an Expert

Expert Multimedia Help is a new CD-ROM title that will make an excellent present for anyone interested in buying a Multimedia PC, or for anyone who has already bought one and wants to know more about it and find out if it's up to scratch.

The CD works on both Windows 3.x and Windows 95, and provides an online tutorial, some performance tests and a troubleshooting section. The online tutorial describes aspects of multimedia and explains (with animation and video) how multimedia hardware works.

The performance tests cover the multimedia components of your machine: transfer rates of CD-ROM drives, video and sound playback, and so on. You're

told how these rates compare with MPC Levels 1 and 2 (but not Level 3).

The testing program doesn't test MPEG playback, but it does test Indeo, MS Video 1 and Cinepak at up to 320 x 240 resolution at both 15fps and 25fps. We used this test to find out whether Microsoft's claims of enhanced video playback on Windows 95 are true. They are indeed. Some of the results were amazing, with Windows 95 displaying as much as six times as many frames as Windows 3.1 using exactly the same PC, as the table below proves. It shows the frames displayed of a video clip running at 320 x 240 with the monitor resolution set at 800 x 600 at 65,000 colours.

This of course means that our second idea for a Christmas present (which has no doubt been recommended elsewhere), has to be Windows 95. There can be little doubt that this is the best operating system (performance-wise) for multimedia, especially for titles which take advantage of its 32-bit capability and all the other goodies which are bound to appear.

Enhanced video playback tests		
15 fps		
	Windows 3.1	Windows 95
Video 1 (15 fps)	111	305
Cinepak (15 fps)	97	305
Indeo (15 fps)	62	292
(Total 305 frames)		
25 fps		
	Windows 3.1	Windows 95
Video 1 (25 fps)	96	492
Cinepak (25 fps)	81	472
Indeo (25 fps)	54	336
(Total 507 frames)		

Another very interesting discovery made while using the Multimedia Help CD is that if a multimedia PC is made to play back video at a frame rate it can't handle — and is therefore forced to drop frames — it will play back at a lower frame rate than the one it's supposed to be capable of.

Our tests showed that a PC which can happily play a 15fps video clip without losing frames drops to an abysmal 6fps or so playback when forced to play a 25fps version of the same video clip, instead of dropping to 15.

This finding is very important if you're developing video for multimedia. Bear in mind that your video will play back OK on the faster machines it's optimised for, but on weaker machines it will struggle, with the result that they will do far worse than their theoretical optimum.

However, the best part of the Multimedia Help CD is its troubleshooting section. During every test you're given a checklist of faults. You select whatever is happening when it shouldn't, or not happening when it should, as the case may be. The program then offers a list of possible solutions, such as driver versions or settings in the system files that you should check.

This troubleshooting section can also be run interactively — using cue cards — as you try things out. Very handy if you do have problems (and who doesn't?). Indeed, what better Christmas present could there be than the answer to all your problems? Wish someone would do the same for us this Christmas.

Add the third dimension

DoubleVision will make someone's Christmas. Your delighted recipient will be able to create 3D images similar to those used



*3D image created in DoubleVision.
You need 3D glasses to view this (red
on the left eye and blue on the right)
— see the PCW Contacts panel.*

in many fifties B movies, which you can view with coloured 3D glasses.

These images are called anaglyphs. They are actually 2D images which, when viewed through a pair of 3D glasses, appear to have physical depth, as opposed to images created in a 3D design program which have perspective but are only two-dimensional.

The product is easy to use, fast and inexpensive. For a 3D effect you need two images. These can be taken using a 35mm camera, a camcorder and frame grabber, a digital camera or a Kodak PhotoCD. The program accepts most of the commonly used image formats (such as BMP, PCX, GIF, TIF and JPEG).

When photographing an object you take one picture, then move a short distance to the side and take another. There's a simple rule: the distance you move to the side, in inches, is approximately half the distance between you and the object, in feet. So if the object is ten feet from the camera, you have to move five inches before taking the second photo. To exaggerate the 3D effect you can increase this distance a little.

Once you have imported the left and right images,

you have to set an alignment marker. This is a common point marked on each photo which defines a virtual central plane. When viewed with the 3D glasses, objects in the image behind this plane will appear to recede while those in front of it will appear to project forward.

And that's all. The program calculates the 3D image which you can save as a bitmapped image to view on the screen or print. See CAR.GIF and also the AVI files on this month's cover CD.

As a little extra, DoubleVision has a utility that can create a pseudo-3D effect out of a single picture.

2D or not 2D

Of course, 3D glasses are just another bit of equipment and 2D can be fine if the

*SoundTrack enables
you to watch video clips
while you record a
voiceover*



effect is impressive enough. The Digital Video Kick Start CD-ROM would make a good present for anyone who wants to do 2D interactive animation and learn about producing digital video. It contains tools, clips, tutorials and everything else you need to get you started in the world of PC-based video.

First of all you get SoundTrack. This enables you to add sound to video files without too much fuss. You load a video (AVI) file and then click the Record button. You then see the video play as you record a voiceover. You can cut, copy, paste, delete, overdub and mix sound files, and there are three audio tracks available.

But the real *tour de force* in this CD is Starlet Movie. This is a full-featured 2D animation program that can be used not only for entertainment but also for serious business. You can create animations either to use as screensavers, or to incorporate into your sales and training business presentations.

Starlet Movie uses vector-oriented drawing, has relatively good image processing and unique interactive animation capabilities. You can create non-sequential animations which can be activated by hot-spots found on specific frames.

The program uses film strips as a storyboard to specify the animation's path, and you can navigate objects using other frame images as references. You can also include interactive buttons, branches, cycles and sound effects.

Bundled with Starlet Movie is a drawing, paint and image-processing program. Finished animations can be distributed with the included runtime module, or saved as a Windows AVI movie.

Another nice little utility that comes bundled with this CD is Matinée. It displays your videos as screensavers. You choose a backdrop, then drag and drop video clips

Christmas wishes

1 Our first, most ardently wished-for wish is an improvement in the three factors affecting multimedia performance: speed, speed and speed.



For instance, what about a fourth-generation authoring tool, such as Toolbook or Director, which produces compiled code and therefore doesn't run frustratingly slowly on a weak machine? What about faster, and cheaper, graphics cards providing software-only MPEG playback?

Multimedia is certainly the future in computing, but it's the present that concerns us. And (compatibility and standardisation problems apart), speed is the thing holding back the real advent of multimedia, because user-expectations (such as full-screen broadcast quality video) are ahead of what the technology can actually deliver at present.

We're bound to see increases in speed, in both software and hardware, before the end of next year, but it's the extent of those increases which will determine how far multimedia is able to fulfil its obvious potential.

2 Our second wish touches on compatibility. We'd like to see more mainstream multimedia authoring packages offering cross-platform functionality — with the Mac, but also Unix, and the Internet. We suspect this is one wish which will at least partly come true because the Mac is so much stronger in the USA than over here, and whatever

the efforts of the European Union to encourage innovation in computing, Uncle Sam is definitely in the driving seat, and will be for as long as anyone can imagine.

3 Wish number three is for a multimedia authoring package that's as easy to use as the mainstream presentation packages like Freelance Graphics, PowerPoint or Astound — and which uses Visual Basic as its scripting language. In our view, Visual Basic, because it's so easy to use yet so powerful, and because it comes from Microsoft, is now a kind of a standard. So the sooner it's incorporated into easy-to-use authoring packages, the better.

4 Fourthly, back to the question of speed. But this time speed of a different kind, though again linked to compatibility. We need to see faster agreement between companies on important issues such as high-density CD formats. Developers and manufacturers need to be able to get on with the job of development instead of worrying about what will be compatible with what. This is essential for users to get the full benefits of multimedia.

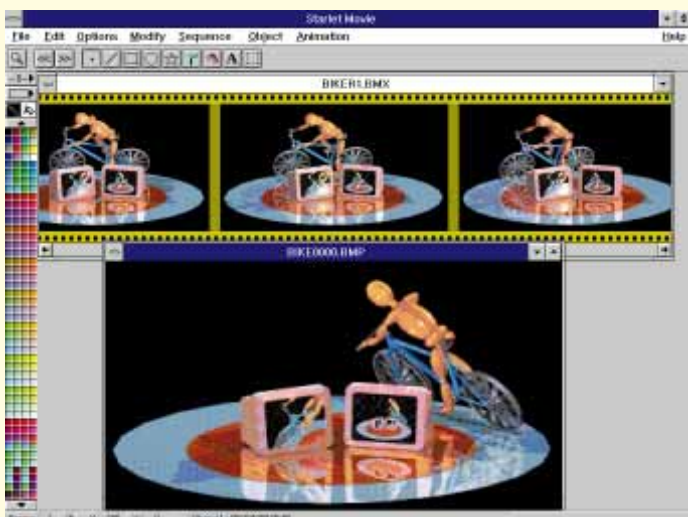
5 Our final Christmas wish is for a living-room multimedia console that will plug into a TV, play MPC-compatible CD-ROMs, and cost £300 or less. Any hope of this coming true? Well, it would require the price of RAM to drop to a fifth of its present value, but who knows what next year holds for chip prices.

into the video sequencer. There's also an option for password protection.

Although the CD doesn't include digital video editing facilities (Adobe Premiere style), there is a tutorial which attempts to get to grips with the mechanics of creating digital video. Topics include a com-

plete glossary of common video terms, a discussion on compression techniques and how to make them work for you, and a section which takes you through the process of creating digital video from scratch.

The CD contains about 150 video clips and about 170 audio files (music and sound effects) — hours of fun for you.



Starlet Movie's vector-orientated drawing provides scope for producing high-quality animation

PCW Contacts

Panicos Georgiades and Gabriel Jacobs will be glad to answer your questions. Either write to PCW, or email g.c.jacobs@swan.ac.uk

Free 3D glasses available from Visual Software **0151 933 8772**.

Fax **0151 933 4108**

Expert Multimedia Help £19 from Software Partners **01954 206 626**

Double Vision £39 from Visual Software **0151 933 8772**

Digital Video Kick Start £29 from LTS **01386 792 617**





Delaying tactics

Create digital delay to enhance a part by using your sequencer, even if you haven't any special effects built in to your synth — **Steven Helstrip** tells you how. There's a new sampling CD with classic synths and one-off effects, and... what Steve really wants for Christmas (*please*).

If you don't have on-board effects on your synth, or you want to add a digital delay to a guitar part and your synth module only has reverb, you can create your own effects from your sequencer.

Adding delay to a part helps in several ways: it thickens and adds decoration to the part — helping it to stand out — and it allows you to create a wider stereo field when using a stereo delay.

To create a basic delay or echo, copy

the part you want to effect and place it on a separate track. In Cubase, for instance, highlight the part (or the whole track), select copy (Control K) and drag the new part to a new track. If you have a spare MIDI channel, the new track can be set to channel 2 or whatever is free. This will allow you to manipulate the delay even further.

Playing the two back simultaneously, on the same patch or instrument, will create a flanging, or chorus, effect (but we'll cover this another time). To create the delay however, you must offset the second track. In Cubase, this can be found in the Track Info Panel. Depending on the tempo of your track, the offset will have to be adjusted accordingly. The table in Fig 1 shows delay settings.

In Fig 2 (delay1.arr on the PCW CD), the guitar part is playing an arpeggio pattern. The delay can be seen on a new track and has an offset of 176ms. In Cubase, each count on the delay parameter represents 3ms and is therefore set to 58. As the delay needs to be quieter than the lead, the track's volume has been reduced. To add further effect, the lead is panned towards the left, while the echo is in the right speaker.

Using the example, try altering the offset to create a longer delay. You may also like to try transposing the delay by 12 (one octave) to produce a sound similar to a 12-string guitar — even play around with the instrument to achieve different effects.

To create a second delay you'll

need to copy the original part to a third track. Fig 3 (delay2.arr on the PCW CD) shows the original with three delays, each playing on a separate MIDI channel. The second delay has been set to 29 (88ms) and the third to 116 (352ms). When each part has been panned-out, the effect is to create a richer and "bigger" sound. Again, try transposing each part and play around with the level and timbre of each of the tracks.

Fig 1 Table of delay settings			
Tempo (BPM)	note	1/8 note	1/16 note
85	705 (ms)	352 (ms)	176 (ms)
90	666	333	166
95	631	315	157
96	625	312	156
97	618	309	154
98	612	306	153
99	606	303	151
100	600	300	150
101	594	297	148
102	588	294	147
103	582	291	145
104	576	288	144
105	571	285	142
106	566	283	141
107	560	280	140
108	555	277	138
109	550	275	137
110	545	272	136
111	540	270	135
112	535	267	133
113	530	265	132
114	526	263	131
115	521	260	130
116	517	258	129
117	512	256	128
118	508	254	127
119	504	252	126
120	500	250	125

Christmas Wishes



Well it's still not snowing in Queens Park. Sainsbury's hasn't ordered turkeys yet, and I certainly haven't thought about sending out any cards. But the

Christmas issue beckons once again, so here's my wish list for the man wearing the white beard.

First on the slate is a new power supply for my PC, since the last one went up in smoke — and it couldn't have happened at a more inconvenient time. I had three days in which to produce and mix three tracks for the band I work with before going on tour. This involved tidying up the sequences (which were on the broken PC), recording backing vocals, guitar, sampling-up all the vocals and arranging the track — a job that, realistically, takes two weeks. We'd been hard pressed enough as it was and we could have done without a major disaster like this on our hands.

Getting hold of a second PC wasn't too much of a problem, but getting the

Figs 2 & 3 Delay patterns



Fig 2



Fig 3

sequences off the hard drive was a nightmare. As it wasn't SCSI, it took a lot of persuading to get it to talk to another system. However, with the help of 40 cans of Diet Coke and 33 cups of coffee the job was finished within the two remaining days.

Secondly, I'd like a new sound card for Christmas, with a few useful extras. Therefore Creative Labs should stop spending so much time developing video conferencing equipment and make a card that has a digital I/O (SP/DIF), eight analogue outputs and 24Mb of sampling RAM. I tend to do most of my pre-production using the AWE-32, simply because it's convenient; the control panel sits beneath the Cubase window and most of my samples are grabbed digitally from the CD-ROM drive and stored on hard disk.

The big problem is that it only has a stereo output limiting the number of samples you can mix individually. An alternative to this would be to have a parametric EQ on each channel and several auxiliary sends with access to high-quality built-in effects such as reverb and delay.

The most important feature on this

sound card, however, is the digital I/O. Every sound card has its own digital-to-analogue and analogue-to-digital converter that turns an audio signal into ones and zeroes to be stored in RAM or disk, and vice-versa. The dilemma here is that they are not up to pro-audio standards and produce noise (no thanks to interference from processors and other cards).

With SP/DIF inputs and outputs, it would be possible to by-pass the on-board DAC/ADC and use a higher quality, external DAC/ADC to do the processing, resulting in a much cleaner signal. It would also mean you could use digital copies from DAT machines to perform edits, then dump it back without degradation. Digital Audio Labs produces the Digital Only card which allows you to do just this, but that takes up an extra slot which I don't have, and it costs more than £400.

Third on my list is several amendments to Cubase. Its most irritating feature is the remote control facility: this allows you to hold down a combination of keys on a MIDI device to activate play, record and so on. You can disable this remote feature but every now and again it



decides to turn itself back on without warning, and I don't want it to. It would be nice to have a customisable button bar as well (like the one found in Word), which would allow you, for instance, to assign a specific groove template to a button instead of having to navigate through reams of drop-down menus.

As I'm allowed ten wishes, I'd like to add another one to the list: another 16Mb of RAM to cope with the increasing size of audio applications; a 4Gb hard drive for direct-to-disk projects; an operating system that gives me some warning when it's about to crash. A few extra buttons on my mouse would be nice too, to activate commands within applications and a 17in monitor to replace the 14in screen I have at the moment.

If I can't have any of these, then I guess a few pairs of socks would be fine. Oh, and some of that lovely aftershave from Marks and Spencer would be nice, too.

Now hear this...

● **Evolution** has announced Sound Studio Professional; a new package that integrates Samplitude (its direct-to-disk recording software) with Procyon Pro, a Cubase lookalike sequencing package. Together they provide up to 100 tracks for sequencing MIDI and four tracks for digital audio. It is also possible to synchronise the two packages.

Procyon's highlights include an intuitive interface; score, piano roll, drum and event editors; on-screen mixers and tempo maps. It was a worthy runner-up in the "Best Creative Software" category in this year's PCW Awards. Samplitude offers full parametric EQ, time stretching, built-in effects and a decent wave editor.

Sound Studio Professional costs £149. "Sound Studio", a scaled-down version, costs a mere £59.99. (Both prices include VAT). Sound Studio is available from Evolution (demos can be obtained from <http://www.evolution.co.uk>).

● **I mentioned** last month that Et Cetera

has developed an interface for WaveTable daughterboards, called MIDI Edge, allowing you to by-pass your sound card and enjoy noise-free output. MIDI Edge has four MIDI interfaces providing 64 independent MIDI channels and will be available this Christmas, for £129. You can buy the excellent Yamaha DB50XG daughterboard (reviewed elsewhere in this issue) with the MIDI Edge for £230.

● **More loops** for the AWE-32. D-Zone records, the people responsible for the Loopisms CDs (see *Hands On*, October) has decided to compile all its samples into one huge library for the AWE-32. The CD will be called "Loopisms the AWE-32 Compilation" (how original) and will contain 150 loops and more than 1,000 keyboard samples. The samples will be arranged into sound banks (or SBKs) and D-Zone is likely to feature several shareware titles. The CD should be available early next year and will sell for £29.99 (incl VAT).

Squishy blocks and bell drones

Time + Space has started to convert its CD library into PC wave-formatted samples. Ambient Volume 2, one of the latest to be reworked, contains a mixed bag of mono and stereo samples digitally recorded at 44.1KHz.

This CD-ROM brings together a fantastic collection of synth pads, vocoder loops and effects taken from the Roland System 100M, SVC 350 Vocoder, JD990, Memory Moog and Oberheim synths to name a few. The samples are arranged in 74 folders, each containing from two to 14 samples. Many can be grouped into the "soundtrack" category, working on their own as, believe it or not, ambient tracks. You'll also find hundreds of one-shot effects described as "Analog Bell Drones, Oscillator FX, Squishy Blocks" and so on. There are plenty of bass and percussion samples, too. And if you're looking for that Vince Clarke sound, you'll find it here. It costs £29.95, including VAT and delivery, from Time + Space. There are ten of the sounds on our free CD-ROM this month, under "hands\sound".

PCW Contacts

Readers' contributions to the Sound column are music to our ears. If you have any hints or tips, any MIDI-related items or general comments — or anything off Steve's Christmas list (just kidding) — send them in to the usual PCW address, or to

steven_helstrip@pcw.ccmil.com
compuserve.com

Evolution 01525 372621,
or email <http://www.evolution.co.uk>
Time + Space 01442 870681





A Class Act

Tim Anderson investigates classes in Visual Basic 4.0, ODBC struggles and PACKing in Delphi.

Visual Basic has not embraced all the features of object orientation. That's no reason not to take advantage of the substantial language improvements which it offers, not least the new class module. This enables you to define objects with their own properties and methods. For those unfamiliar with classes, here is a short introduction. In VB, you create a class module by choosing Insert — Class module. Then press F4 to show the property sheet for the class. For example, you might create a product class, and set the Name property to clsProduct. Next, define custom properties and methods for the class. For example:

```
Option Explicit
Public name as string ' name of the product
Public description as string ' describes the product
Public productID as string ' identifies the product
Public stock As Long ' number in stock
```

Now you can use the class in your code, for example:

```
Dim Widget as new clsProduct
Widget.name = "Widget"
Widget.Description = "A very handy thing indeed"
```

But this is no more than the old user-defined type by another name. The difference is that classes also support methods and property procedures. For example, it is dangerous to expose Stock as a public property. It would be all too easy to set it to a wrong value by mistake. The answer is to rewrite clsProduct as follows:

```
Private lstock as Long ' visible only
```

```
to class methods
Property Get Stock() as long
stock = lstock
end property
```

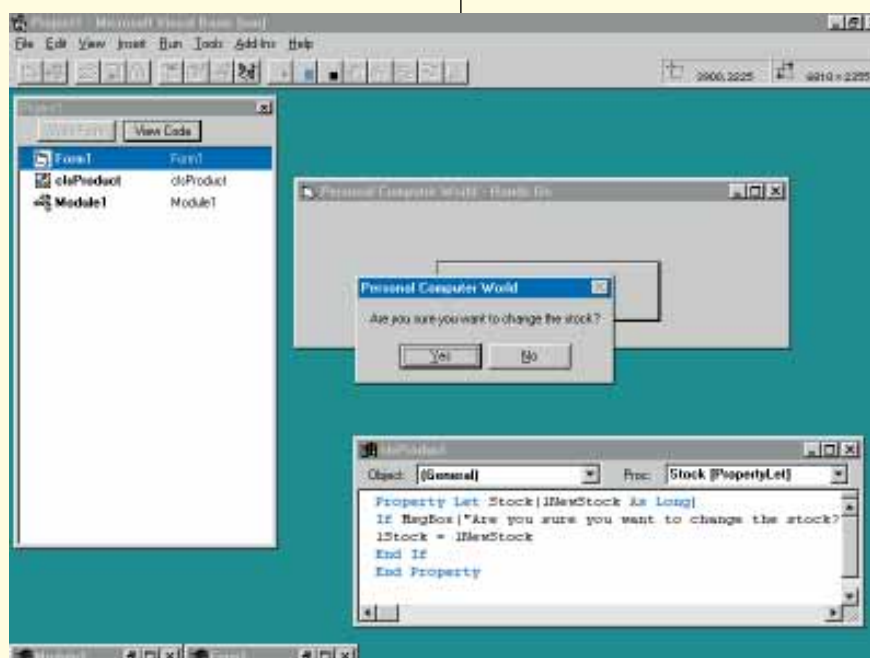
```
Property Let Stock(lNewStock) as long
if msgbox("Are you sure you want to change the stock?", vbYesNo) = vbYes then
lstock = lNewStock
endif
end property
```

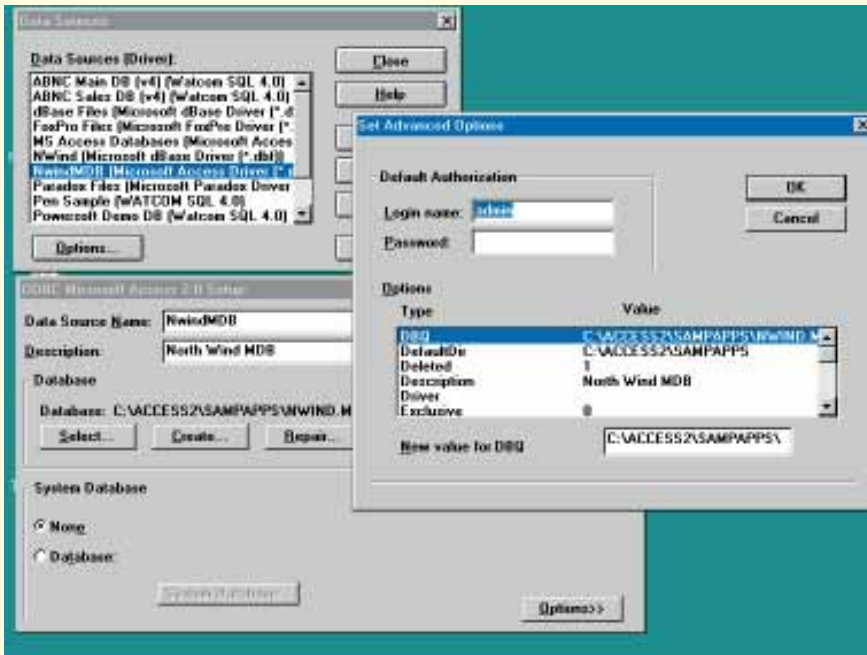
You can test the new class as follows:

```
Dim widget As New clsProduct
widget.Stock = 34
MsgBox widget.Stock
```

Note that when you set the Stock property, the confirming dialogue appears. In the real world, the confirming dialogue can be replaced by whatever code you require to ensure a valid stock update. You can prevent a negative value, for example; or check a User object for authorisation. Even better would be to replace the Property Set procedure with two methods, AddStock and ReduceStock. Gradually the code becomes more robust and easier to reuse (simply import the class module into another project).

Using VB 4.0's class modules, you can easily create applications that validate and protect key data





Setting up an ODBC driver — do you really want your users to see this?

There is more to say about OO programming in VB, and future *Hands On* columns will return to this subject.

● How are you finding Visual Basic 4.0? Please contact me to say what you think of the new release and how you are using the new features.

Wrestling with ODBC

Steven Fletcher has written a database application using Visual C++ and ODBC. He writes: "I decided to use Microsoft Access as the Database builder and standard. My programs access the databases via CRecordset and CDatabase using a ODBC link to my Access Database files. This has been an effective method so far. The main problem I have using ODBC is the installation of the software on other PCs. Firstly, ODBC has to be installed, then the database files have to be copied across. ODBC has to be set up to recognise the installed database and it must be given the correct name for the program to read.

"Is there an easier way of installing my program together with ODBC? And since JET is a direct MS Access engine, can I use and link via CRecordSet with JET?"

Steven has hit on one of the least appealing aspects of ODBC, when used for applications that are to be distributed. ODBC consists of manager software, plus one or more database drivers, plus one or more data sources which use those

Dear Santa

It's that time of year again. And dear Father Christmas, I wrote to you last year with some very reasonable Visual Basic enhancement requests, few of which have been fulfilled. What did I ask for? Oh yes, a compiler. And object oriented extensions to the language — yes, I know we got the class module in VB 4.0, but somebody forgot inheritance. And decent error handling — what happened to that? And Visual Basic for the Mac, where are you?

Maybe I shouldn't complain. You did deliver three of the things I asked for. Version control was one, and VB 4.0 is miles better in this respect. A rich text edit control was another, although I had hoped it would run in Windows 3.x. And you excelled yourself with the third: I asked for more competition for VB, and now you can't move for VB lookalikes. Incidentally one of these, Borland's Delphi, delivers most of the other items on the list as well.



Software development, they say, is the triumph of hope over experience.

Here's seven modest requests for 1996. Over to you Santa.

1. A VB compiler, OO VB, better error handling (for details, see last year's list).
2. Slimmed-down Microsoft Office, broken into small OLE components that make Office automation a more realistic proposition.
3. Microsoft and Borland to agree on a single DBF standard (see Fig 1, page.330).
4. An end to the O/S wars. Last year my VB 3.0 program ran fine on Windows 3.x, NT and OS/2. Now 32-bit Windows has messed up everything.
5. A 12-month break in publicity for Windows 95. No, make that a permanent break.
6. Visual Basic for Applications in Word.
7. Working OpenDoc applications, and not just on the Mac, but on OS/2 and Windows as well. If this is a superior alternative to OLE, we need to see it in operation — soon.

drivers to access specific databases. All these are a shared, system-wide resource. If you want to create an ODBC application which can be delivered as a shrink-wrap and easily installed onto any Windows PC, there are several problems to solve:

1. The target PC may or may not have ODBC installed.
2. The drivers you require may or may not be installed.
3. The data source will presumably not be installed, although if you are unlucky the

data source name (DSN) you chose may already be in use.

4. ODBC is a version control nightmare. If your application installs the latest versions of the manager and driver DLLs, there is always the chance that some other ODBC application will no longer work.

5. To add to the fun, there are now separate 16-bit and 32-bit ODBC versions, both of which may be installed on the same system.

The immediate conclusion is that ODBC is best managed in a corporate environment, where the IS department can control and configure the installations as required. But this is shrink-wrap software. That leaves two other possibilities. One is to ship the ODBC installation disks as supplied by Microsoft, and carefully explain to the user that they need to install ODBC from the separate setup disks, run the driver manager, and set up the data

source name. That is asking a lot: end users should not have to face intimidating dialogues asking them to configure data sources.

That brings us to the alternative, which is to control ODBC programmatically from your own installation routine. To do this you need to obtain the ODBC 2.x SDK from Microsoft; it is on the MSDN level two disks. Your setup program will need to copy across the ODBC DLLs, and then call the ODBC API to configure it. For example, there is a function called SQL-



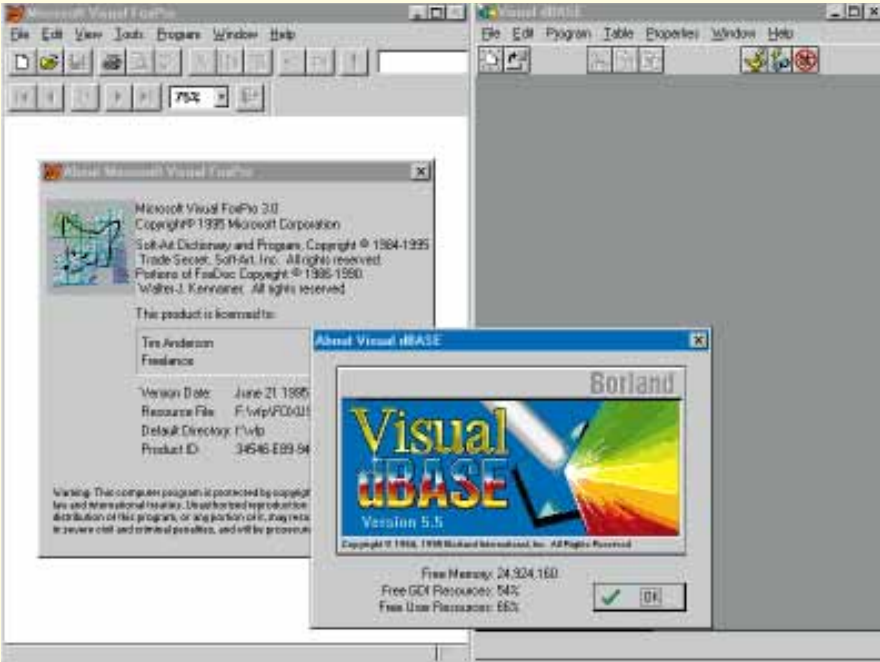


Fig 1 Two xBase databases — two incompatible data formats. Why?

program?” Strangely, although Delphi uses the same database engine as dBase itself, table objects have no Pack method. The only way round this is to use lower-level BDE functions, which Borland have documented in a file called BDE.HLP, available for download from Compuserve and no doubt elsewhere. Using these functions is much harder than programming the usual database components, and not often necessary. The following skeleton routine successfully packs a table on my system. Note that for this to work, the table must not be in use elsewhere. To use this in earnest, you need the full

description of the parameters and possible error messages, contained in the Borland help file:

```
uses
... DBiTypes, DBiProcs, DBiErrs;

implementation

procedure PackTable;

var
hMyDb : hDBIDb;
iResult: Word;

begin
```

```
dbiInit(nil);

iResult := DbOpenDatabase(nil,'STANDARD',
dbiREADWRITE,dbiOPENEXCL,'',0,nil,nil,hMyDb);
{note database must be opened exclusive}

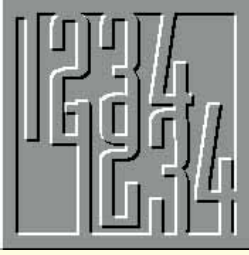
if iResult <> DBIERR_NONE then
MessageDlg('Error opening database',
mtError,[mbOk], 0)
else
iResult :=
dbiPackTable(hMyDb,nil,'C:\MYTABLE.DBF','DBASE',False);
{table must not be in use elsewhere}

if iResult = DBIERR_NONE then
MessageDlg('Packed table OK', mtInformation,[mbOk], 0);

iResult := dbiCloseDatabase(hMyDb);
iResult := dbiExit;
```

PCW Contacts

Tim Anderson welcomes your Visual Programming comments and tips. He can be contacted via PCW at the usual address, or
freer@cix.compulink.co.uk



High interest

Mike Mudge gets to grips with the Hugo Steinhaus problem, and plays around with powers.

Given an initial positive integer, n_0 , written as

$a_r a_{r-1} \dots a_1 a_0$ in radix 10;

that is,

$n_0 = a_0 \times 10^0 + a_1 \times 10^1 + \dots + a_{r-1} \times 10^{r-1} + a_r \times 10^r$,

(where the a_i are digits from 0,1,2,...,9)

an interactive process is defined by repeatedly forming the sum of the q^{th} powers (where q is a positive integer) of these digits. Thus,

$n_1 = a_0^q + a_1^q + \dots + a_{r-1}^q + a_r^q$

etc.

Case (1) $q=2$. It has long been known that this iteration leads either to the cyclic sequence of length one (1), or to the octad (4, 16, 37, 58, 89, 145, 42, 20). See Arthur Porges', *A Set of Eight Numbers*, *American Mathematical Monthly*, Vol.52, pp 379-382, 1945.

Case (2) $q=3$. Here, there result five possible cyclic sequences of length one (1), (153), (370), (371), (407); two possible cyclic sequences of length two (136,244), (919,1459); together with two such cyclic sequences of length three (55,250,133) and (160,217,352). See Kiyoshi Iseki, *A Problem in Number Theory*, *Proceedings of the Japanese Academy*, Vol.36, pp 578-583, 1960.

Moving on in the natural way to

Case (7) $q=8$. Ichiro Takada, *Computation of Cyclic Parts of the Steinhaus Problem for Power 8*, *Mathematics Seminar Notes, Kobe University*, Vol.7, No.3, pp 543-546, 1979 reveals four cyclic parts of length one (1), (24678050), (24678051), and (88593477); one cyclic period of length three (54642372,7973187,77124902); one cyclic period of length twenty-five (9514916,...,65602117) and one cyclic period of length one hundred and fifty-four (14889347,...,67672102).

Note; these latter two cycles can be entered from $n_0=2$ and $n_0=3$ respectively, whilst the smallest number leading to the cyclic period of length three is 111348.

Case (9) $q=10$. The only cyclic period known to the writer is of length one and is (4679307774) see, for example, Tim Sole, *Computer Bulletin*, page 9, 1981.

PROBLEM STEINHAUS A. Investigate the Steinhaus Problems of order 8, 9 and 10 confirming and completing the results quoted above.

PROBLEM STEINHAUS B. Generalise the investigation to $q=11,12$, etc and attempt to construct a theoretical model for predicting the behaviour of this algorithm.

PROBLEM STEINHAUS C. Investigate the effect of change of radix of the arithmetic from ten to say 8 and 12, i.e from decimal to octal and hexadecimal.

PROBLEM ASSOCIATED STEINHAUS. What happens when the sum of the q^{th} powers of the digits is replaced by the q^{th} power of the sum of the digits?

UPDATE ON SOPHIE GERMAIN PRIMES. These numbers were introduced to *Numbers Count* readers in *PCW* December 1993. P is a Sophie Germain Prime if and only if $2P + 1$ is also a prime. SG proved a truly beautiful theorem: If P is a Sophie Germain prime, then there are no integers x,y,z different from 0 and not multiples of P , such that $x^p + y^p = z^p$. A recent communication, via Nigel Backhouse, advises that Harvey Dubner has regained the record for the largest SG Prime (at 3rd October, 1995) with the same 5082 digit number

$P=2687145 * 3003 * 10^{5072} - 1$.

WHAT ABOUT AN UPDATE ON WILSON PRIMES?

Readers of *PCW* June 1984 learnt that if P is a prime and $N!$ (factorial n) denotes the continued product of all the integers from 1 to N inclusive, then $(P-1)!$ is congruent to -1 , modulo P : which means that the WILSON QUOTIENT, $W(P) = ((P-1)! + 1)/P$ is an integer. Now if $W(P)$ is congruent to 0, modulo P ; which means that $(P-1)!$ is congruent to -1 modulo P^2 , then P is called a WILSON PRIME. Only three such numbers are known; 5, 13 and 563....causing H.S. Vandiver to observe "This question (whether there are infinitely many Wilson Primes) seems to be of such a character that if I should come to life any time after my death and some mathematician were

to tell me it had been definitely settled, I think I would immediately drop dead again."

CAN POWERS OF TEN BE

INTERESTING?

An INTERESTING POWER OF TEN is defined as one which can be expressed as the product of two ZERO-FREE factors.

10^{18} together with $10^{33} = 8589934592 \times 116415321826934814453125$

are the only interesting powers of ten between 10^9 and 10^{5000} . Reference, Mike Mudge, *Computer Weekly*, 5 September 1985. Do there exist infinitely many interesting powers of ten? Is there an algorithm (other than search and test!) for finding them? What are the next terms in the sequence 18,33,...used in this context? Any investigations of the Steinhaus problems and other matters referred to above may be sent to Mike Mudge, 22 Gors Fach, Pwll-Trap, St. Clears, Carmarthen, DYFED SA33 4AQ to arrive by 1st April, 1996. The sender of the best solution will receive a £25 book token. Contributors should include details of hardware, coding, run times and results. Please note that material can only be returned if a stamped addressed envelope is provided.

Review of Numbers Count -146-, PCW June 1995

A disappointing overall response — could this be a function of the summer vacation or the choice of topics? There is a great deal of Smarandache-related material available, the latest collection being *Smarandache Function Journal*, vol. 6, no.1, June 1995, ISSN 1053-4752, published by the Department of Mathematics, University of Craiova, Romania, and available from Dr R. Muller, Number Theory Publishing Co, PO. Box 10163, Glendale, Arizona, 85318-0163, USA. However, the "suitable subjective criteria" has yielded a prizewinner from The Permutation Problem, Mark W. Lewis of 6 Hill Drive, Failand, Bristol BS8 3UX, with a neat combination of computation and algebraic theory. Details available on request.

PCW Contribution Welcome

Mike Mudge welcomes readers' correspondence on any subject within the areas of number theory and computational mathematics, together with suggested subject areas and/or specific problems for future *Numbers Count* articles.



Backup to Basics

Stephen Rodda checks out Hewlett-Packard's new Windows 95 DAT backup package, has an argument with Winfaw Pro 7.0 and creates web pages with the help of a Hot Dog.

With Yuletide firmly in mind, I have been perusing the world wide web, and I've found a few locations which we of the networking fraternity might find interesting: <http://www.engr.wisc.edu/~ballard/bofhserver.html> contains almost everything a BOFH ("Bastard Operator From Hell") could wish to read, including an excuse server: this gives you an excuse of the day for why the network isn't working. And there are several stories from <http://prime-mover.cc.waikato.ac.nz/simon.html> which might give you some ideas about what you can do to your users. Don't think that I actually *condone* any of the activities he gets up to, though.

In a more serious vein, I've been looking at the latest present from Hewlett-Packard, Colorado Backup for Windows 95 which, it is said, will back up under Windows 95 to a SCSI DAT. I tried it out, backing up my 3Gb of (visible) disk space and the NetWare server to my drive. It seemed to have worked perfectly. But being a sceptic to the last, I decided to do a test restore. Unfortunately, the whole thing blew up in my face as it was reading the tape, and caused an exception error.

Giving it the benefit of the doubt, I tried again, just backing up one 1Gb partition, but no — a gig of files (perhaps it's got something to do with the number of files on the partition) was too much for it. I think this version must have escaped, rather than being released. Whilst I was writing this column, H-P released another version, 1.01, which is now available and seems to have most of the bugs fixed. I downloaded it from CIX and tried again.

I installed the program, and this time it seemed to work properly, turning in a very

respectable 25Mb per minute in backup speed. "This is too good to be true," I thought. I waited until the backup was complete and then left it to compare. Once this was over, with no errors, I thought I'd restore a few files to another area of the disk. This I did, and compared them using the DOS utility. I found that they all compared.

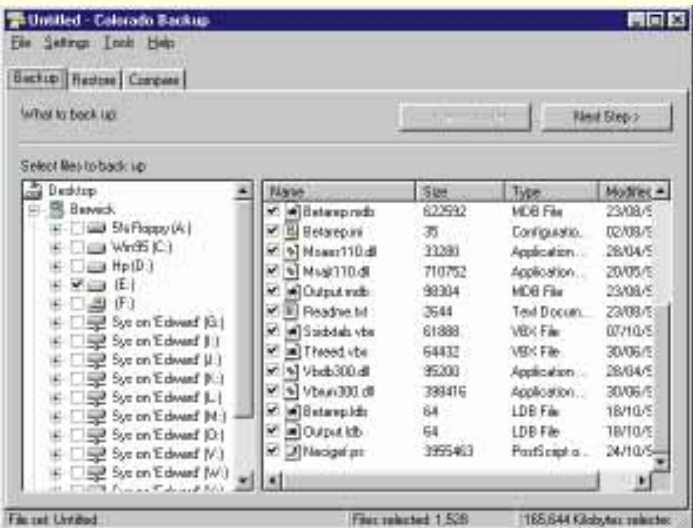
Remember, it's not enough to back files up, you should restore a random selection and compare them with the source files. That way you can be sure you have a valid backup. It's also a good idea to occasionally try restoring a few files from an archived tape since you never know when you might need them, and it'd be a pity if your drive couldn't read them due to head wear or misalignment. Don't forget it's important to clean a DAT regularly (and any other form of tape drive too, for that matter). Some DATs will give an error condition if they have not been cleaned frequently enough. Sometimes this error condition will, unfortunately, indicate that it's too late for cleaning and

the drive needs to be returned for servicing. A DAT uses approximately the same sort of transport technology as a video recorder, only it's a little more choosy. Please keep your heads clean and only use a proper cleaning tape.

Windows NT

Just hitting the BBSs as I write is the Microsoft Windows NT service pack 2 for 3.51. Version 3.5's service pack 3 has arrived, too. Both these are included on this month's cover CD. I still find, however, that the new NT Explorer shell (also available on MSN and Compuserve), doesn't seem to approve of either of these service packs, so you either get your bugs fixed or you have the new shell. Service Pack 2 addresses a few bugs found in the disk utility of NT and in Services for Macintosh, as well as a few esoteric ones (which, incidentally I haven't noticed) in

H-P Colorado Backup for Windows backup screen



Problem solving

More hard disk on NetWare

I was recently passed a page torn from your article in *PCW* addressing the problem of upgrading a 2G hard disk on NetWare 3.12 to a 4.2G hard disk. I have mirrored the disk successfully and have even set it active, and everybody here at our office is using it — however, the remaining disk space is still unavailable.

How do you partition span? Is it a option within Install or is it a little more fundamental with FDISK? I've tried various methods to no avail. Can you help?

SN@cis

First and foremost, I suggest you get a subscription to PCW, so that you don't have to rely on the generosity of others in order to read my column. Seriously, though, I'm sorry I didn't give the complete procedure in my article, but for the benefit of you and all the others who asked the same question, here follows the procedure:

First set up the new disk, naturally with a DOS boot partition and, still in DOS, having formatted the DOS partition with the /s switch to transfer the operating system, use XCOPY C:. D: /s to copy all the files and directories from that partition to the new disk.*

Make sure that you have a boot floppy with a copy of FDISK on it to hand. Now run AUTOEXEC.BAT to load the server and start NetWare. Once the server is started, load the install NLM, choose the Disk option, and edit the partition table of the new disk to give it one large NetWare partition, spanning the whole of the available hard disk surface.

Hot fix areas are not important with modern hard disks as they do their own hot fixing, so a small hot fix area (of about half of one percent should be enough). If you see any NetWare hot fix areas being used, this is a danger sign, it means that the disk's own hot fix area is now full, and the disk is probably on its way out.

Now choose the volume option and make a note of the exact size of the old volume. Create a volume with the same number of blocks on the new disk, and establish a mirror between the new volume and the old. Now go away and leave NetWare to its own devices until the new has mirrored the old. Break the mirror and down the server.

Change the new disk to be the primary boot disk, either removing the old disk or re-addressing it as another drive. Now boot using the floppy and run FDISK to activate the DOS partition of the new drive as bootable. Removing the floppy and FDISK should now reboot your system. With NetWare up and running, load install once again and select



Continued on page 337

other modules. I know there's a school of thought which says "If it ain't broke, don't fix it" but the patches for NT are wide-ranging, and I recommend that you pop the CD into the drive and run the patch routine.

Winfax Pro 7.0

I tried installing the Beta version of Delrina's Winfax Pro 7.0: I imagine the version numbers were skipped so that it integrates with Microsoft Office 95 (also running currently as 7.0, of course) under Windows NT 3.51 with the explorer shell.

It gave me a somewhat enigmatic message, telling me that I had to be installing it under Windows 95, Windows NT 3.5 or later. "I have got a later version," I yelled. Unfortunately, Winfax wasn't paying attention.

Turning this time to Windows 95, Winfax installed very smoothly and even managed a small amount of MAPI integration.

The second quarter of next year should see voice messages integrated into Winfax (for those with voice modems) so

perhaps I may have some of my wishes granted by Santa this year.

It seems a pity that more people don't use modems as they're intended. As far as sending faxes is concerned, they're great. Many people though, seem to forget the technology by which these modems (even over ordinary telephone lines) can extend your network arbitrarily.

This technology isn't *totally* seamless but if you know someone will use a modem to pick up your fax, and that the technology is capable of doing it, using either Windows MS At Work Fax or Winfax's Fax a File, it is possible to send things quickly. I know one firm with an email account which has only just got around to teaching one of its staff members how to use it.

Unfortunately, this particular member of staff is generally out of the office, so their email system is out of commission for more than 50 percent of the time. I'm currently waiting for a file from them, and I'd get it faster if they were to parcel up the floppy disk up and sent it by



Problem solving (contd)

the volume option. Add the free space to SYS: and your new drive's full extent is now addressable under NetWare. Oh, just one thing. Don't even think about this (or any form of server upgrade) unless you have three working backups on separate tapes. You never know what might happen; backup tapes seem to be very attracted to mugs of hot coffee.

Two machines on one modem

Mr Rodda, I know that you are a busy man but could I pick your brain about networks and connecting to the internet?

I have two machines which run under Microsoft's Windows 95 peer-to-peer network using TPX/SPX protocol with Genius Ethernet adaptor cards. I know they are cheap, but they seem to work OK and I also have a dial-up internet connection. I wonder if it is possible to connect to the internet on both machines using only one modem? Can you enlighten me on this subject, or point me in the direction of some good books to read?

Alex McF@cityscape

There seems only to be one question: "Can I share my modem or internet connection over the LAN?"

There is a great number of answers. The most expensive (and almost definitely overkill for you) is to use the Instant Internet box which I reviewed. Since it's in the region of £3,000 (and you did mention that the Ethernet adaptors are cheap and cheerful), I reckon that you, like me, would find this out of your price range. The other methods all involve sharing the modem.

One method which doesn't really involve sharing the modem would be to buy a modem for the other machine so that it could access the internet all by itself. This may not be as stupid as it seems, since sharing software can cost as much as a modem.

The other method would be to share the modem over the network using Winport from Lansource (contactable as lansource@cix.compulink.co.uk). About £100 for (I think) five users.

Install Windows NT on the one computer that has the modem connected. That will share the TCP/IP connection over the LAN. This method may well be cheaper, because you may find someone with an unwanted copy of Windows NT who would be willing to sell it for a small consideration.

I hope this answers your question (it may however, only pose more...).

international courier.

Kodak XLS 8600 PS Printer

This month I managed to get Kodak to let me look at the XLS 8600, a colour PostScript printer which also allows its input to be in a raster format — useful if you're initially working with a raster image, such as in Photoshop. You can select this raster input format from the control panel (it's not available concurrently with the PostScript mode). The new printer has quite an advantage over the Kodak ColorEase PS which I last reviewed. Whereas the ColorEase PS had a maximum print area of 10ins x 8ins; with its different ribbon and media the new machine will print full A4, with trim marks. It also comes with an optional Ethernet interface for network connection, supporting TCP/IP, NetWare and Apple EtherTalk.

It comes as standard with an external SCSI connector and 32Mb of RAM. This external SCSI connector may be used in PostScript mode by an external hard disk, or in raster mode by a machine which can transfer the raster image data to it direct

(as can the Ethernet connection). It uses thermal transfer technology and fonts are sharpened by anti-aliasing.

The result is near-photographic image representation. My graphic designer colleague, Jeff, tried it out from his Macintosh: he was impressed, and Jeff isn't easily impressed by computer equipment.

I set it up on my NT server, installed the correct driver for the printer and networked it around the Windows network in about three minutes, publishing a spooler for the printer onto the AppleTalk network at the same time. I reflected that it would have taken me between ten and 15 minutes to do this under NetWare. Although this sort of printer shouldn't be looked upon primarily as a production printer, at £2 per sheet it compares favourably with a small run on a four-colour press. Especially when you consider that the ribbon will also (optionally) laminate the print.

The PostScript interpreter didn't seem to know anything about creating multiple copies. I later spoke to the people at



Kodak and they told me that the interpreter would certainly create multiple copies — either our test program or the driver must have had a buglet.

The three-colour print technology consisting of yellow, magenta and cyan is extremely lifelike, although CMYK ribbons are available for pre-press colour proofing. I tested it as well with monochrome prints.

Apart from a very slight mis-registration between the process colours (yes, I was being *extremely* critical), the



Hot Dog editing one of my Netscape bookmark HTML pages

Christmas wishes

Dear Sinterklaas

According to legend in the Netherlands, Santa Claus (known there as Sinterklaas) comes from Spain on the 5th December, along with his Moroccan helper, Piet who deals with naughty children by putting them in his sack to take to Spain in his boat.

Last year I asked him for an 8Gb DAT drive with software which runs on any platform you care to throw at it, more hard disk space, and a super turbo nutter machine with a truecolour adaptor and a 21in monitor.

I got the H-P SureStore 6000 8Gb DAT and a really nice H-P 2Gb hard disk. I suppose if I really wanted to, I could actually backup and restore using a much-ported UNIX utility called "tar", which will run on every operating system I use. It reads all of its own backups, no matter which platform they came from along the way, but I'd really prefer a friendlier utility. So far I've tried Arcada, ArcServe and H-P's Beta



version of Colorado. I confess my favourite is Arcada, but at present I'm still looking for something which will run on every platform I have, and Arcada doesn't quite do that yet.

With last year's failings out of the way I shall deal with this Christmas. Apart from the super turbo nutter machine, I'd like a leased line to an internet service provider. And I want the internet to go faster. Oh, yes, I'd like totally integrated telephony and communications, dealing seamlessly with data, fax, email and voice.

Oh, yes, please give all my friends PCs if they haven't got them, and an internet connection too, so that I can talk to them via internet telephony, saving international telephone calls. Oh, just save yourself time and effort: cable up the whole world with fibre optic data and television and give us all our own IP addresses while you're about it.

Hey, Piet, Put me down! I don't want to go to Benidorm.

black was good and solid. Kodak tells me there is also a monochrome ribbon available. In all cases, the output was near-photographic.

The cost of this printer is \$10,000, (about £6,000). This is cheaper than the ColorEase which weighed in at about £7,000. Now I know this isn't a cheap option, but for a professional in repro, or even for a firm's DTP department where presentation quality is all-important, it will soon justify its cost.

Hot Dog

Just as a very quick aside, I've recently been creating a few world wide web pages (with Jeff looking over my shoulder now

and again, making helpful comments like "Ugh!") and I've found that by far the best product was Hot Dog. I recommend it to anyone trying out HTML editing. It's written in Visual Basic and as a result it may possibly be a little sluggish with a few files open, but on my 486-50 it seemed tolerably fast. I'll be comparing it to Netscape Gold when that's available and will let you know all about it. At the moment, though, Hot Dog's the business.

PCW Contacts

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Finger clicking good

You can't use the keyboard to click on web hyperlinks, or can you? Stephen Cobb suggests we should be prepared to shell out for our computers, plus, move over PCs and make room for the NC.

Brian Taylor asks: "Is it possible to click on hyperlinks at web sites using a keyboard, without a mouse?" As a seasoned keyboard user, I have wondered about this myself, but never had the time to investigate further. Brian has been

forced to investigate, because his PC allows only one serial device at a time. It's mouse or modem, but not both.

To avoid having to remove my fingers from the keyboard to grab a mouse, I have learned just about every Windows

keystroke.

For example, you can use Ctrl and Tab to switch between open documents in most Windows applications except Word and WordPerfect, where you have to use Ctrl plus F6. When I hunt for files with File Manager I press Alt, then F-for-File, then h-for-hunt, then I can re-name a file with n-for-name (the key letter for Rename) and so on.

One of my complaints about Windows 95 is that not only has it changed the key characters (m is now the key for Rename), it has also abandoned any pretence of providing a keystroke for every command. In my opinion, this is one Macintosh emulation we could do without.

After loading four web browsers onto a Windows 95 machine I found that one, Quarterdeck Mosaic, does allow you to use the Tab key to select links and the Enter key to activate them. These keystrokes complement the usual Page Up/Down keys which most browsers support, in addition to some handy Ctrl keys for Forward and Backward. If these keystrokes prove popular, we may see other browsers following suit. The browser market is becoming very competitive, resulting in growing feature lists. For example, Quarterdeck Mosaic has the best link organising capabilities that I have seen. The more you surf the web the more important these become. And Quarterdeck Mosaic comes with a very extensive hot list already arranged by category, giving you a great selection of sites from which to begin your explorations.

'Tis the season

Either I am having an exceptional run of bad luck or the reality of PCs today is a dismal saga of crashes, conflicts and blatant over-selling. I used to put this down to Beta-testing; a chore which a few experienced users performed as a courtesy to product developers. Since I was always reviewing products that were not quite finished, I naively assumed that by the time they got to market someone would have removed all the bugs and incompatibilities that I had experienced.

But these days it seems as if we are in a constant state of Beta-testing. Just look at the hottest sector of the market, communications, and the hottest spot of all, the world wide web. Most people are using browsers that are Beta versions. Even the "shipping" versions are updated so fast it makes your head spin. For example, when I called Quarterdeck about its Mosaic browser, I was told: "Next week we will have a new version with more 'Netscapisms' and the version coming out the week after that will have even more." Companies are talking about product cycles in terms of weeks, not months or quarters, let alone years. One reason my wish list includes a plea for more bandwidth is that even 28.8Kb/sec seems awfully slow when you are downloading 2Mb worth of program upgrade.

It's not just software, either. My wife



Top The display of pages in Quarterdeck Mosaic illustrates how much difference a browser makes — and compare it with the same page in Microsoft Internet Explorer on the Right: Microsoft Internet Explorer is an attractive browser, but why such a confusing name? (The page displayed is the same one as in the Quarterdeck screen)



Christmas wishes

1. A PC that works properly
I am sick and tired of PCs that don't work as they should. I love my Compaq Concerto notebook, but every time I use the PCMCIA fax modem for faxing, my internet dialler has a fit and I have to slide the modem out to reset it. I like my wife's Macintosh PowerPC, but we still can't get TCP/IP running. I've debugged scores of computers since the three days I spent in January 1983 figuring out how to get a Kaypro to boot up and print.

2. More bandwidth

Communication continues to be the most exciting part of computing and today's V.34 modems are a quantum leap over the first 300-baud unit I plugged into that Kaypro. But even at 28.8Kb/sec the web fails the teen test (that's when you tell your teenager to come and see a cool web site and the pages load too slowly to keep her attention).

3. A really good operating system

You know, one that doesn't gobble up your RAM and devour your hard disk. One that installs and upgrades easily. One that doesn't use confusing commands and inconsistent function key shortcuts.

4. More bandwidth

At 28.8Kb/sec it still takes far too long to download software. Of course, these days downloading software means 2Mb



demo versions of web browsers.

5. Agreed standards for secure online transactions
Wouldn't it be great if Microsoft and Visa and Netscape and MasterCard and all the others would just agree on a standard and we could all get on with cyber-shopping in time for next Christmas?

6. More bandwidth

Imagine a world where everyone had ISDN. We could video-visit and telecommute and reduce pollution and improve productivity and regenerate our communities.

7. Software that doesn't crash

Is it just me or are we all losing too much work because the software crashed?

8. More bandwidth

What if we could run the internet on the co-axial cable TV line? We could get megabytes per second instead of kilobytes. The world would be a better, faster place.

9. Fresh air

I could do with more time away from the computer. It's getting bad when you come home and say "I'm ready to download", instead of "Let me tell you about my day".

10. Peace on earth

And goodwill to all creatures great and small (this should really be top of the list).

uses a Compaq Presario CDS774, which generally works quite well. But for the first month she struggled to diagnose a vexing problem with the built-in modem, which insisted on operating in silent mode. Eventually she fixed it after opening the case for a peek at the Pentium processor (to make sure it wasn't one of those flawed chips). Next to a "Made in China" sticker was a modem card improperly seated in the bus slot, looking as though it had been assembled that way.

Or take the slender, Pentium-powered Venturis 590 desktop machine that I have on loan from Digital — a lovely machine, but I have not been able to access the floppy disk drive ever since I installed Windows 95. Since I had to take the network card out to get past a hiccup in the Win95 install routine, the serial ports are currently the only way in or out. Microsoft support, after a one-hour call on my bill and a 90 minute call-back on theirs, decided to "kick it upstairs" for further research. The last word from Digital was to "load the latest

version of the flash BIOS", which suggests that hardware, like software, has entered a never-quite-finished state of being.

It is 13 years since I ordered my first personal computer, a KayPro II, with twin 360K floppy drives and 64K of RAM, for approximately £1,795. A 15-characters-per-second Brother daisywheel printer cost another £1,000. Today, the same cash outlay gets you a powerful multi-media system with a 600dpi laser printer. Perhaps we should be prepared to shell out a bit for our computers. That way, vendors could afford to fix problems, either in product development or by employing service people who arrive immediately and don't leave until everything is working.

If a KayPro II, which came with a suite of software, including spreadsheet, database and word processor, was the standard personal computer of 1982, today's standard, a multimedia PC, should cost at least £4,500 (£1,795 converted from 1982 values to allow for inflation). ➡

Whence the NC?

"Fast, cheap, networks mean (powerful multimedia) computers will cost \$500, not \$5,000," according to Oracle CEO, Larry Ellison, who calls the new devices network computers, or NCs. He sees the network computer as a basic input/output system that downloads a complete operating system when switched on; a process that will only take a few seconds. The advantages of NCs are many, says Ellison. For example: "If there is a new operating system you don't go down to the store — you turn the NC on the next day and it's there. It's not a major cultural event." Ellison believes that such machines can be sold profitably for a fraction of the price while achieving higher performance than PCs. "The reason you need 16Mb of memory is that

Windows 95 needs 8Mb — that's half for them, half for you," he says. On the other hand NCs will require only between 4Mb and 8Mb of memory, even to accomplish multimedia tasks. With a dig at Intel, Ellison notes that NCs will not have to wait for new technology. "For \$20 we can buy a faster microprocessor than an Intel Pentium at \$460 — sounds like a good deal to me." In another wry prediction, Ellison observes: "Network computers will not replace PCs; after all the PC didn't replace the mainframe. PCs have hundreds of thousands of uses. The NC has just four: internet browsing, electronic mail, word processing, and video-conferencing." He adds: "By the way, that's all I ever do with my PC, and that's all my friends ever do with theirs"

A Happy New Year?

Hardware has to be less complicated and software has to become leaner and smarter so that users can spend more time being productive and less time trying to become computer consultants and upgrade experts.

Consider what happens when you use a sophisticated comms program like WorldGroup. When you log on, the server checks to make sure your client software is current. If not, it upgrades you automatically and in the background. Now suppose you replace your modem with a network card attached to the coaxial line from the cable TV company, running at 10Mb/sec. Finally, replace your hard disk with a ROM that boots the operating system from the network. That is where we are headed, according to Larry Ellison,

chairman and CEO of Oracle.

Speaking at the Telecom 95 expo in Geneva, Ellison predicted: "Personal computers will be replaced by new devices that rely almost exclusively on fast networks and have very little intelligence inside." He cited Oracle's interactive television set-top box, now being used in trials in the UK and the US, as the first example of such a next-generation device. He went on to describe the network computer, or NC, as another such device (see *Whence the NC*, above). This has seismic implications for the traditional structure of the computer industry. For example, software and data storage might become a subscription service. Software and hardware conflicts could be banished, eliminating end-user frustration and slashing support costs for vendors.

Now it is beleaguered network managers who wrestle with access control, backups, anti-virus protection and fault tolerance. All this could be shifted to a central service, with huge economies of scale. There would need to be adequate protection of privacy. Access would have to be tightly controlled. But the technology to achieve this already exists. Users could be issued with smart cards to control access to the network, which would incidentally eliminate "laptop-lugging" as an executive health risk. The card would give you personalised access from any NC, such as the ones installed in hotel rooms or the backs of airline seats. You insert the card and instantly begin work, as if you were at home using your own NC.



The browser, I presume

Can anyone explain why Microsoft chose to name its internet browser the Microsoft Internet Explorer, right after launching the File Manager in Microsoft Windows 95 as the Microsoft Windows Explorer. Not confused yet? Well, try troubleshooting a Microsoft internet Explorer problem with a Microsoft Support Engineer, using Microsoft Windows Explorer.

This choice of product name is not the only evidence of verbal fixation in the Microsoft web browser. The darn thing insists on referring to hypertext links embedded in web pages as Shortcuts, as though Microsoft had invented the entire notion (Windows 95 users can create desktop icons that launch applications with a feature called Shortcuts). Before we know it the word will be trademarked and cash registers will ring every time someone says "Turn right at the roundabout, I know a Shortcut."

PCW Contacts

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Keep taking the upgrades

*It's never a perfect world, even for Mac users, but **Chris Cain** points out some recent releases to help make it better, and dreams of the ten best things Apple could do to make him happy in 1996.*

As it's that time of the year again, I've been compiling my top ten Mac wish list for 1996. It includes products that are scheduled to appear in the near future, and things that would be beneficial to Mac users everywhere. But first, there are a few important software updates that you should know about.

After my experiments with PCW's 9500 last month, I've discovered that RAM Doubler 1.5.2A doesn't work properly with any of the PCI PowerMacs. An email to Connectix brought the news that version 1.6 is in beta testing and should, hopefully, be available by the time you read this. As with the company's other updates, it will be a free fix, downloadable from all good online systems.

Apple's Open Transport networking code for PCI Macs has also undergone several bug fixes. The current release is

Christmas wishes

Here is a summary of my complete list of wishes for 1996.



- 1 Copland OS
- 2 Clearer error messages
- 3 Stable, native QuarkXpress
- 4 New Microsoft Office
- 5 RAM Doubler v1.6
- 6 A catchier name for the Performa
- 7 Better software bundles
- 8 PCI Mac clones
- 9 QuickTime and QuickDraw 3D accelerators
- 10 All systems sold complete

If all or most of the wishes on the list are granted it'll be a very happy new year for the Mac.

If you have a Mac wish list or something that you think I should have included, please drop me an email.

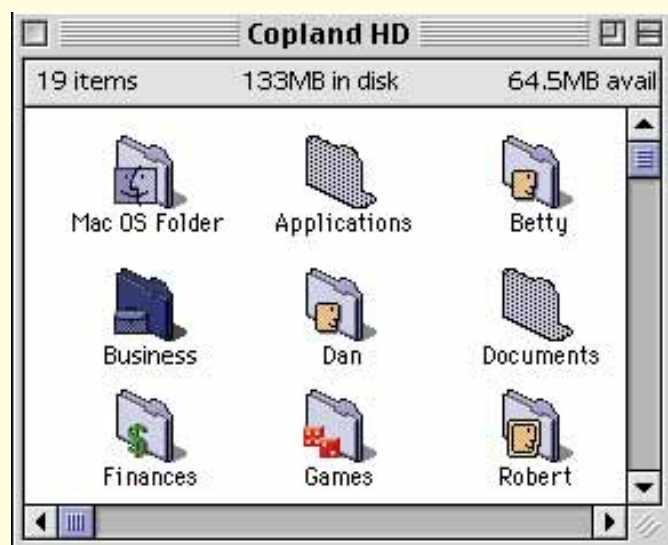
1.0.7 and can be downloaded from Apple's usual software support sites on the World Wide Web. If you use this regularly I recommend moving up to the latest version as soon as possible. Several people here at VNU towers have experienced grief with older versions. You need to be using version 1.0.6 to upgrade to 1.0.7. Users of earlier versions should contact their dealers.

On the applications front, there has been another change to Photoshop and a new release of Quark Xpress 3.3 is on the cards. Last month saw the release of Photoshop 3.0.4 and now 3.0.5 has been posted on the internet to fix a small bug with previews. As for Quark, the company's home page reveals that version 3.3.8 is just around the corner. Quite what features this will offer is not known, but even if it only manages to crash less it will be a worthwhile upgrade.

Other software upgrades include Plaintalk 1.4.1, an improvement to Apple speech recognition software; Aaron 1.1.3, now with awful spinning windows; and version 1.0.2 of Id's Doom 2, which adds more music and cleans up a few graphic glitches. All are available online.

Transport problems

It appears that even if you don't use a network, Open Transport can still give you major hassle. Because of the way the OT code is designed, it significantly increases the size of your system software. This can cause a serious memory shortage on 8Mb and even 16Mb machines, limiting users to loading only one or two applications at a time. Even removing the shared libraries from the Extensions folder doesn't help.



Along with changes to the user interface, Copland promises a substantial performance increase

Why doesn't OT follow the QuickTime example and load code only when needed?

Top of the pops

Making my top ten Mac wishes for 1996 (see boxout opposite) wasn't easy. There are quite a few things I'd like to see happen and narrowing the list down to ten took some doing.

Preferably without the spinning windows, or at least with the option to turn them off, Copland is easily my first choice. This more up-to-date and PowerPC-native version of Mac OS should provide a tremendous performance increase for PowerMac users when it arrives.

At present a large portion of the PowerMac OS runs under Apple's 68000 emulation software. While a few key system extensions have been re-coded for RISC, we won't see the true power of the architecture until everything that can be is reprogrammed. It's no good making the jump to new hardware if your system software doesn't follow suit.

As well as at least 95 percent native code Copland promises a robust pre-emptive multi-tasking microkernel, an improved file system and a customisable interface. You'll be able to adjust the levels of interaction to the ability of the user and the Apple Guide help system is expected to move from a Show Me to a more satisfactory Do It For Me arrangement. Apple also claims that Copland will incorporate QuickDraw 3D, much-needed improvements to virtual memory and enhanced multimedia functions. An early release next year is essential to keep Apple ahead of the game now that Windows 95 is here.

Repeat in English, please

While we're waiting for Copland, my second wish would be for more understandable system error messages. I get quite annoyed when I'm told the application failed due to an error of type 1010. I've used a Mac for long enough to know that this is usually the result of a bus error, and that restarting and possibly assigning more memory to an application will solve the problem. But that's only a guess. Besides, that message is only one among many others that have me and most systems departments baffled.

So, Apple, how about converting error messages into English phrases like 'This program requires more memory to run' or 'This application has unexpectedly quit with a Bus Error because...'. Even MS-DOS gives you more of a clue with 'Bad



Games like Doom II would be better for Performa software bundles than old titles such as Spectre

command or file name when you type something it doesn't understand. It's impossible to know the reason for every error, but the Mac could certainly be more friendly when they occur.

Number three on the list is a more stable PowerPC native version of QuarkXpress, the most popular Mac application for DTP. The latest version has caused more headaches in our production department than any other software. In fact, some people have refused to use it and have gone back to running the 68K version under emulation. It's slow but it's stable and most of the bugs are well known. I know I'm not the only person looking forward to the release of 3.3 revision 8.

Fourthly, the PowerMac version of Microsoft Office is in dire need of a rewrite. Compared to WordPerfect 3.5, Word is ridiculously slow, and Excel takes an age to load up even on an 8100/80. For no good reason, both products are nowhere near as impressive as their PC counterparts, and many Mac users prefer to use older, non-native versions.

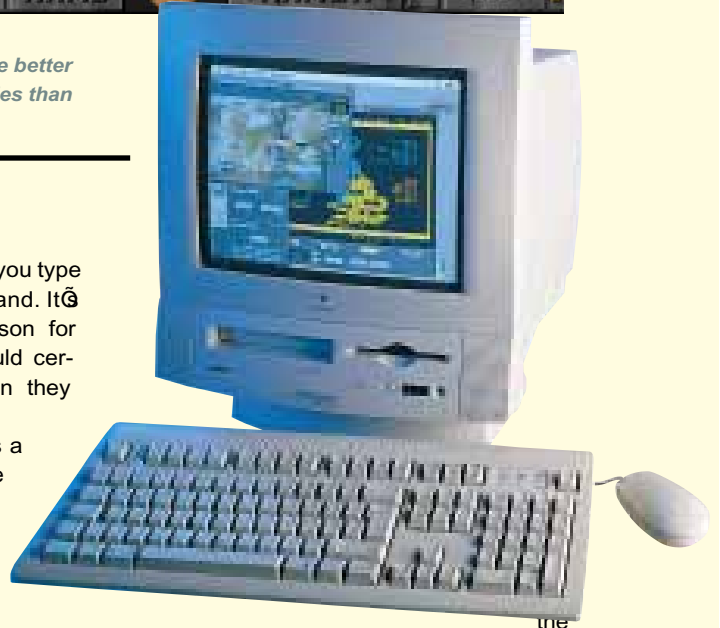
Microsoft has some of the best coders in the world and it's about time the company sat a few of them down in the Mac Office division. It would be good to ring in

the new year with a new improved version.

Double RAMmy

The PCI Mac-compatible version of RAM Doubler also makes it onto the wish list. This program is the best-selling Mac utility in the world and for a good reason. It actually does what it claims to do. An excellent idea would be a pack that combines both Speed Doubler and RAM Doubler for a reasonable price. Connectix could call it something cheesy like the Mac Performance Pack, and it would sell like hot cakes.

Number six is a request that Apple comes up with a better name for its Ready-to-go-Performa series. Although the machines are well specified, and the latest 5300 model is especially nice with its



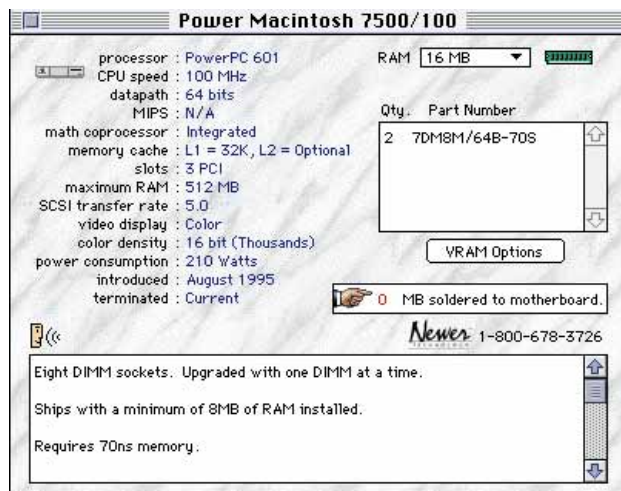
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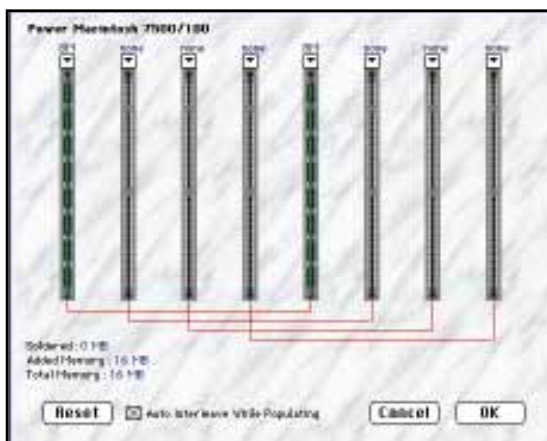
Utility of the Month

January's Utility of the Month is ideal for anyone who's thinking of adding more memory to their Mac. Guru 1.1.1 from Newer Technology is a freeware application that tells you how much and what type of RAM you can install in your machine, complete with diagrams.

After selecting the type of hardware you have, from a comprehensive list including the new PCI machines, Performas, Powerbooks and even some Apple printers, up pops a box showing basic specifications. From here you can tell the program how much RAM you want and it shows the correct SIMM configuration. An interactive picture of the motherboard lets you change SIMM sizes about in different slots to see the results. Guru 1.1.1 will also test existing memory for any defects. It's available from online services and is on this month's cover CD.



Left and below
Guru takes the guesswork out of memory upgrades
Bottom Jazz up your Mac with some Christmas icons



MPEG1 decoder and 16-bit stereo sound, the name makes these models sound inferior to the Power Macintosh line. What's wrong with calling all of them PowerMacs, with some models sold more cheaply than others? If the range has to be segmented, how about using the old LC or Classic name extensions? Performa just doesn't say 'come and buy a Mac' to me.

If this isn't possible, then I'll settle for a better selection of bundled software. Most PCs come complete with Microsoft Office, and it should be standard on Macs as well. ClarisWorks, a great little integrated package that's ideal for a one man band, is not really in the same league. Speed Doubler and RAM Doubler are natural choices for a bundle, and how about some good games instead of out-of-date titles like Spectre Supreme and Super Maze Wars? Marathon, Doom II, Dark Forces and Descent (when it arrives) would all be much more appealing. For kids, the Broderbund Living Books series is ideal, as is Microsoft's Encarta.

The last three items on my wish list are PCI Mac clones; affordable QuickTime and QuickDraw 3D acceleration cards; and finally, every Mac to come with a monitor and keyboard as standard.

Taking the plunge

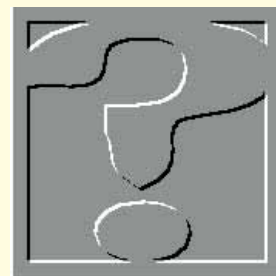
Inspired by Cliff Joseph's article about PCI PowerMacs in the November issue, I decided it was time to upgrade to one of them. Having hesitated between the 7200 and 7500, I finally settled on the latter, almost entirely on the grounds that I'd be able to add a 604 processor card to it, saving another major upgrade in one or two years' time.

So far I can report that the machine has been compatible with everything I used before, save RAM Doubler, and that the difference in performance between the new machine and my old 7100 is quite noticeable. If you are thinking of making the same move, I will continue to report on

PCW Contacts

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Apple Computers 0181 569 1199
Quark <http://www.quark.com>
Connectix utilities available from Computers Unlimited 0181 200 8282
Microsoft 01734 270001



Any questions?

If you've got a PC problem or think you could help out other readers, contact **Frank Leonhardt**.

Hewlett-Packard LaserJet 4L — a classic

You've probably heard about Hewlett-Packard's laser printers. They're the ones with which all the other manufacturers have to make sure their offerings are compatible.

This should not imply that Hewlett-Packard is necessarily the best, but it is generally considered that you can't go too far wrong if you buy the real thing. At the very least, your software is guaranteed to work, and if it doesn't, the supplier has no excuse.

Now that the baby of the range (the LaserJet 4L) has suddenly dropped in street price to around £350 it might seem like a good deal. After all, you can't beat the crisp, clarity of a laser printed page compared to an inkjet.

Now the LaserJet costs about the same as a mid-range inkjet, you don't have to pay extra for the quality. Okay, so it won't do colour and the inkjets will. But colour comes at a price in terms of speed, output quality and running costs. If you're out to impress your bank manager, the near-perfect black-and-white of the laser has something while the slightly smudged, gaudy colours of the inkjet just won't cut it.

But how does the cut-price LaserJet 4L compare to the competition? You can get a Windows GDI laser for less than £300 now. Yes, but that's not LaserJet compatible. PCL5, the LaserJet's language, will be spoken for many years to come but GDI (Windows' language) might be changed with Windows 96? No thanks; I'd personally prefer a printer which will be supported for a long time to come, especially if it only costs an extra £50.

For a few quid more, you can pick up



The HP LaserJet 4L — now it's down to £350, it's a good investment

a Kyocera FS400. These talk PCL5 too and, as Kyocera keeps reminding us, are cheaper to run. They have several nice features including the ability to re-fill with toner without the need to replace the whole drum assembly. You wouldn't be paying Hewlett-Packard £70 per Megabyte for upgrade RAM either.

Whether lower running costs make a difference to you depends on the anticipated printing volume. Many LaserJet 4L users are still on their first cartridge after two years.

If you were suspicious, as I certainly am, you might be wondering why the price of the 4L has suddenly dropped. The answer is simple — at the time of

writing, all other models in the LaserJet 4 range have been superseded by the 5 series. Rumour has it that the LaserJet 5L, when it appears, will support 600dpi printing as opposed to the 300dpi of the 4L.

When the 5L does show up, it will either cost considerably more than the 4L, allowing old 4L stock to be shifted, or the price of the 4L will fall further still. 600dpi may be better, but it's not that much better. The 4L always worked well and has stood the test of time. This could be your last chance to buy a classic.

Start me up, let me down

I currently use a Pentium, running Windows NT and 3.1. I decided to load Windows 95 on the system but because I am a software developer I wanted to keep all three platforms separate. I proceeded to



load Windows 95 into a separate directory.

After loading 95, I booted the system up. The NT startup menu was given, Windows NT or Windows 95 — but my MSDOS selection had vanished. Windows 95 had overwritten MSDOS with Windows 95 DOS.

I selected the Windows 95 option and was launched into Windows 95. The only way to start Windows 3.1 was to launch into Windows 95 then shut 95 down to DOS, change directory to the original Windows 3.1 and type Win. Not the perfect method.

Later I decided to take Windows 95 off the system until I was fully ready to upgrade the installed 3.1. Because Windows 95 had not been installed over 3.1 it did not give the option to backup DOS and 3.1 in case I needed to uninstall them later.

I decided to delete the Windows 95 directory and reinstall DOS 6.2. After deleting the Win 95 DOS directory and the Windows 95 directory I rebooted the system with the DOS 6.2 installation disk in. I selected to install DOS but was given the message "Cannot install over present version of DOS".

I still had the NT platform I could start up. In the end I had to load NT and delete the IO.SYS and MSDOS.SYS files to install DOS (a dirty job but it had to be done). I re-installed DOS 6.2. Finally I had my system back to its former glory.

Is there a way to install Windows 95 and keep MSDOS 6.2? Would there be an easier way of launching 3.1 without having to go through Windows 95? I hope this doesn't happen to anybody else.

Steven Fletcher
steven@ams-neve.com

This sort of thing should definitely be tried on a "friend's" machine first. I've had Windows 95, Windows NT, DOS 6.2 and OS/2 all installed on the same hard disk. The tricky one is to get DOS 6.2 and Windows 95 to co-exist.

As you discovered, Windows NT only allows for one DOS partition in its boot selector and if you install Windows 95 on your primary DOS partition — and you have no choice in this — then selecting DOS will take you to Windows 95 instead.

What isn't so obvious is that Windows 95 has its own hidden startup menu. If you press F8 when the message "Starting Windows 95..." appears on the screen you will get eight choices. Most of these are to do with starting Windows 95 in different debugging modes, but option eight will load and run your previous

version of MSDOS — the one you installed Windows 95 over.

Option six — Command prompt only — will take you straight to a DOS 7 command prompt, though it still insists on announcing itself as Windows 95. This DOS-only mode appears to be completely compatible with DOS 6 and, as I mentioned in last month's issue, this includes Windows 3.11.

If you want to get rid of Windows 95 after installing it in a directory on its own, simply use the MSDOS SYS.COM command to put DOS 6 back into the boot sector and then apply DELTREE to any directories it has left behind.

Upgrading on a budget

I have a 386SX 33 with 4Mb RAM and 290Mb total hard disk space. Do you have any suggestions about the best way I should approach upgrading?

I don't have much money to spare. I am thinking about maybe a co-processor, or a CD-ROM or more memory. Which would you recommend? I do a lot of work in Windows and dabble in ray-tracing.

Chris.Roberts@p0.f152.n441.z2.fidonet.org

I wouldn't invest in any more old-style SIMMs. 4Mb should be enough to run all the software a 386SX is capable of handling sensibly. If you want to run the current generation of software, everything will have to be changed.

A CD-ROM drive would be an investment for the future but it would help to have an up-to-date IDE compatible one to work with your next machine.

As you imply, you have more than one hard disk you would have trouble attaching it — the standard IDE adaptors can only handle two drives.

If I had a machine like this I'd save up my pennies for a P75 motherboard. This would be useful if you want to do lots of hard sums like those involved in ray-tracing.

Don't bother with a maths co-processor for the 386SX — it won't deliver nearly the same bang-per-buck ratio as the Pentium.

Here we go hacking DOS again

I am doing some programming and I need to know how Win95 keeps track of the long file names.

As you probably know, DOS directory saves only space for 11 characters and Win95 can have 255-character file names.

I need only technical information; over

here in Yugoslavia we don't have much literature on the subject.

Boris Dragovic
lynx@galeb.etf.bg.ac.yu

I'm afraid I don't have an official answer from Microsoft about this, but I got curious and decided to have a look for myself. The extended file name is actually stored in the normal directory space on the disk, where you would expect to find traditional directory entries.

Each standard directory entry takes up 32 bytes. This consists of the actual name, (11 bytes), the file attributes byte, ten bytes of padding, the time/date stamp (4 bytes), the starting cluster number (2 bytes) and the length (4 bytes).

Windows 95 makes use of at least eight of the ten bytes' worth of padding but I haven't figured out what it does with them. The long directory name itself is simply stored in as many of the preceding 32-byte directory slots as required. It appears that 16-bit ASCII is being used as every other byte in the name is a null on my English version of Windows.

The first slot prior to the conventional directory entry contains the first 13 characters of the long name, the next slot back contains characters 14 to 26 and so on. The mathematically adept will probably have spotted that each 32-byte slot should have room for 16 letters, but some of the positions are used for other purposes.

The first byte appears to hold a counter to show how far back from the true directory entry we are. Bit six is set to show that this is the earliest slot in the list.

Offsets 12 and 13 are used for some purpose I haven't guessed yet. 26 and 27 seem only to contain nulls. As this is usually a pointer to the first cluster in the FAT for the file in question, they could be left at zero to prevent some disk utilities from doing something unfortunate.

This just leaves offset 11. In a normal directory entry, this is the attribute byte and so it is here. It always contains 0x0F which translates to a hidden, read-only, system volume label which doesn't need backing up. This combination of attributes is what prevents older versions of MSDOS from displaying garbage when it encounters one of these strange directories.

I should stress that this is guesswork on my part. It should allow you to write a DOS 6 utility to read long file names, however, which is about the only reason for needing this information. If you're trying to write disk hacking utilities for Windows 95, drop me a line and we'll discuss fees.

Christmas Wishes

Dear Santa,

A year has passed since I last wrote to you — apart from the postcard from Benidorm. So how well did you do? Last year I asked for:

• More memory and hard disk space:

Well, I upgraded to 8Mb and fitted a second 540Mb hard drive. Sorry Santa, but as it turned out, this just wasn't enough RAM. It was okay until Windows 95 appeared, together with that enormous new version of Office. Another 8Mb, please.

• A set of hexagon ball drivers, torx drivers and Bristol Multiple Spline drivers so I can take these new portables apart:

Got'em, thanks. Zenith, Dell, TI and HP watch out — your notebooks' little secrets are no longer as safe as you thought!

• Plug and Play (retrofitted to the whole world's PCs)

This was a tough one and I didn't expect too much. As it turned out, Windows 95 and Windows NT seem to handle hardware management quite well using old non-P&P machines.

On the other hand, the P&P machines I've come up against don't appear to be that good at configuring themselves automatically. So far so good, but you could do better.

• A paper-less office

Nought out of ten for that one, I'm afraid. Back to the drawing board.



• Something to re-attach the pins which snap off ICs when you remove them from their sockets.

Very funny — switch everything to surface mount so that there are no more pins to break off.

This wasn't quite what I had in mind, and you know it.

I want:

Two and a half out of five isn't bad, but see if you can do better with this year's requests:

1. A version of Windows 95 which works as well as Windows NT or as fast as Windows 3.11.
2. A good enough excuse to justify the purchase of a Hewlett-Packard 4020 CD-ROM writer. At around £750 it may be excellent value, but it's still too expensive to get away with buying it on impulse.
3. An electronic stills camera which can realistically replace a good quality 35mm SLR, priced so that an amateur can afford it. It would be a distinct advantage if it worked with my existing collection of outrageously expensive lenses, while you're designing it.
4. A floppy-disk substitute which holds at least 100Mb per disk. Sorry Yamaha, Iomega et al. Any drive with media costing more than a couple of quid doesn't count. Perhaps Sony could be persuaded to develop the audio Minidisk?

Christmas may be the only excuse to justify buying the HP 4020 CD-ROM writer

5. A colour printer which produces output as good as a laser and is as cheap as an inkjet.

6. Some way to let a room full of people see what is on a PC screen without it costing an arm and a leg. Projection monitors are far too expensive, not to mention heavy. Flat LCD panels for overhead projectors aren't cheap and the OHP itself is bulky. What would be nice is a small, low cost LCD display which can fit into a standard 2in slide projector. How about it, Santa?

I don't want:

And while you're listening, how did you do at keeping last year's nightmares away? — you know, the things I didn't want to find in my stocking:

• A Pentium PC — let some other mug find out which expansion boards work with Pentiums and which don't.

I was right, wasn't I? You remember what happened just after I wrote, but I'm pleased to say that these are off my most unwanted list at last. Even that "good value" Escom P60 which turned up for review a few months later with a dodgy configuration and detached floppy drive has been purring away quite happily every since. No, I'm not going to risk a P6.

• A SoundBlaster "compatible" audio card

Unless these beasts use the same hardware as a SoundBlaster, they never turn out to be 100 percent compatible in practice. No change there!

• An upgrade to the latest version of any application.

Let someone else find the bugs. I think I'll include operating systems this year.

• Anything written in Visual Basic (real programmers use C or assembler)

You cheated. Now the dabblers are using MFC or OWL to produce colossal, badly designed applications with C++ too.

**Yours,
Frank.**



PCW Contacts

Frank Leonhardt is an independent computer boffin who can sometimes be contacted on **0181 429 3047** or via email as **frank@dircon.co.uk** or **leo2@cix.clink.co.uk**. Letters may be sent to PCW at VNU House, 32-34 Broadwick Street, London W1A 2HG, but individual replies are not normally possible. Please do not ask about cover disks or CD-ROMs.

Laser Printers:

Kyocera **01734 230700**

Hewlett-Packard **01344 369222**





That internet thing

If just thinking about the internet brings you out in a cold sweat, take heart. Eleanor Turton-Hill's Christmas present to you is a guide which even your Granny will understand. And she's got plenty of time to email her Christmas list to Santa, too.

Just recently, I've received a deluge of phone calls and mail from people asking naive but nevertheless strangely astute questions about the internet. Things like: "What is it?".... "Why is it?" ...and more specific questions like "How on earth do you attach your phone cable to the back of your PC?"and "Why would I want to be connected to it anyway?"

All this leads me to the conclusion that it's high time we had a beginners' column on the internet, explaining what it is, what use it may be to you, and how you actually get connected.

What is it?

At present, there's something of a competition going on to define the internet; probably because it's not the easiest thing to explain in a few clear sentences.

Essentially, the internet is a huge network of smaller networks connecting millions of people all over the world. But when people talk about the internet they aren't really talking about the physical machines and wires which make it work. They're actually

referring to the facilities they use and the people they meet when they're online. According to recent statistics there are now over 30 million people using the net worldwide and this is growing by an estimated one million per month.

So, what on earth are all these people doing? You may well ask. The internet is not, (as you might think) a tool for extremely technical people who do incredibly sophisticated things with their computers all day. It's actually a usable facility for people with any level of computer expertise. You can exchange electronic mail, transfer files, search for information, discuss your political opinions, get news updates, place orders to buy things and obtain access to software. The list is end-

less. If you have any kind of specialist interest, or a problem which requires expert advice, the chances are that someone out there will know about it.

TCP/IP

If you have an internet connection in your office, you may have heard your network administrator talking about TCP/IP. To any normal human being this sounds like complete gibberish but it actually refers to a fairly simple concept.

All over the world there are networks of machines connected to the internet, and hence to each other, by whatever means are available. For example, you can make connections using a dedicated leased line, an ordinary telephone line or even a microwave link.

The computers connected to the internet are very different in terms of their hardware platforms and operating systems, so standard communications protocols are needed to ensure compatibility between different setups. The protocols which developed out of the ARPANET project (see the internet panel, adjacent) were the Transmission Control Protocol and the Internet Protocol (usually referred to as TCP/IP).

The networks which make up the internet are connected by computers called routers, which decide how to transmit data in the most efficient way from one part of the network to another. The Internet Protocol addresses data in small packets, ensuring that the router knows where to send the data. TCP makes sure that these tiny packets of data are protected by placing them in a kind of electronic "envelope". Without the envelope, the packets of data could very easily get damaged or lost. Essentially what TCP/IP means to you is that it doesn't matter whether you've got a

powerful Pentium PC or an old 8086 — it ensures compatibility between machines

How to connect

Getting onto the internet is a fairly simple operation these days. You don't have to be an academic or a manager in a big corporation to get yourself online.

What you need is a computer and a modem. So if you haven't got either of these, you're going to have to buy them. Next on the list is to find a "service



Netscape is one of the most popular navigating tools for retrieving and viewing documents on the internet

provider" — an organisation which will provide you with an internet connection.

There are three basic types of connection: the direct connection, the SLIP/PPP connection, and the dialup/terminal version.

A direct connection provides you with a permanent and dedicated link to the internet. This is extremely expensive and is generally only available to people in big corporations, academic institutions, and government departments.

The second method is to get your access from a company which has a direct connection itself and allows subscribers to dial in and use it. Using an ordinary telephone line, SLIP and PPP are the protocols which make this technically possible.

There are three main benefits from connecting in this way. You get your own hostname; you can download files direct to your computer; and you can use a graphical browser on the world wide web.

Third is the dialup connection which is offered by commercial service providers like Demon, Delphi or Compuserve. You will be charged on a monthly basis for a range of services and access to their internet gateway. With this type of connection, you are not linked directly to the internet. You're actually connected to their system, which in turn is connected to the net, so you don't have a hostname as such. Instead, you're seen by the rest of the internet as name@bigservice.co.uk.

Downloading files happens in two stages: once to download to the online system and the second time to download to your own machine. See *Net.newbies* in our *Cutting Edge* section for more information on how to get online.

Christmas Wishes

Around this time of year we usually make a few wild wishes about what we'd like for Christmas, or some even wilder wishes about what we'd like the industry to deliver in the near future.

Of course, there are lots of computer products we'd like Father Christmas to dump on our doorsteps on Christmas day, and like a lot of people, I'd be quite partial to a nice Pentium 120 with all the trimmings — preferably with a nice big 17in monitor. I'd also like a nice big flat-bed scanner, a high quality A3 colour laser printer, ...oh and a CD-writer please ...the list could go on and on.

But there are other, more fundamental, wishes on my Christmas list for which I'd gladly sacrifice my Pentium120.

The PC is hampered by a whole load of historical accidents, which have



unfortunately been built one on top of the other. The result is a machine which is intimidating, frustrating and at times very hard to explain, especially to people who have no computer knowledge. If computers are ever going to become a real mass-market product, they have to be usable by ordinary people who are not prepared to spend large amounts of their time struggling with interrupt conflicts.

The Plug and Play standard has gone some way to sorting this out. In case you don't know, Plug and Play is a design philosophy and a set of specifications set up to improve the level of integration between PC components. The ultimate Plug and Play dream is that when you install a new device in your PC, the process should be entirely automatic and transparent: no more endless tinkering with system files and jumper settings to get your hardware bits to talk to each other.

The Windows95 installation procedure has gone some way towards achieving this goal, but unfortunately it's all still very hit and miss. A Plug and Play BIOS in your system will help matters by resolving device conflicts, and these have begun to ship on systems from major manufacturers including Dell, Gateway, and Packard Bell. But perfect Plug and Play still has a

So, where did this internet thing come from?

The original idea for the internet developed out of an American defence department agency called DARPA (Defence Advanced Research Projects Agency). In 1969, it began a project entitled "Resource Sharing Computer Networks", which attempted to provide a system to enable the exchange of military information between distant sites. This project was motivated by a certain amount of paranoid cold-war thinking: ie finding a way to communicate over long distances in the event of a nuclear war. The solution was a simple network of four computers called ARPANET (later changed to ARPANET).

The system was a great success and by 1972, the network had grown to include 37 computers with a well-used email system. By 1983, the system had grown to such an extent that the military research component was moved to a separate network called MILNET. A year later NSFNET was established by the National Science Foundation, another US government agency. This linked together five supercomputers and made their information available to educational establishments. For the first time, the internet had become open to people outside the area of defence work, and the

number of people using the system mushroomed. By 1987, NSFNET had so many sites connected to it that the whole system infrastructure needed a complete overhaul. At this time NSFNET was opened to academics, government employees, educational centres and international research organisations.

During this period, of development a lot of experimental work was carried out to find the best way of connecting computers. Different networking methods were demonstrated using various media including satellite, radio, telephone, and Ethernet and several different packet switching methods were used. All of this experimental work formed the foundations of TCP/IP (Transmission Control Protocol/Internet Protocol), but it wasn't until 1983 that all nodes on ARPANET were required to use it.

There's a lot of debate about precisely when the internet began — it all depends on how you define it. The internet as we now know came into existence in about 1990. It is now available to anyone who has the means to connect to it. Over the past ten years the growth of the internet has been incredible, increasing from 5,000 users to about 30 million.

long way to go, and will probably be on my Christmas wish list for a few years yet.

Following on from this month's column, I'd like more people to be using email. Like a lot of people in the computer industry, I use email for a good proportion of my work-related communication, and I also have a handful of computer-literate friends who have email addresses. But wouldn't it be great if email was just as everyday and universal as the telephone.

You could send your Auntie Ethel (you know, the one you never remember until it's too late) that last minute birthday wish, laced with sound and graphics. You could book up meals in your favourite restaurant at the click of a button, order your shopping from the local supermarket and so on.

Some of these things are beginning to happen already, but so far they're on a very small scale. The email party has only just begun.

PCW Contacts

Eleanor Turton-Hill welcomes any feedback and suggestions from readers, on
ellie@pcw.ccmil.compuserve.com

Following reports in an earlier *ChipChat* that the sum of the ASCII characters in the name "William Henry Gates III" totals 666 and that an anagram of the same name is "Willy G I'm Satan Here", Microsoft this month finally revealed its true colours to the world via the internet.

The Microsoft Windows 95 home page may appear squeaky clean on the surface, but digging deeper reveals the true nature of the world's most successful software company...



Snail's pace

Those French are a funny bunch. Not only do they carry out dubious nuclear tests and bake their bread in a funny shape, they refer to the @ symbol in email addresses as "petit escargot". They must have terribly slow internet access...



Selling yourself

Targeted junk mail is something we all have to put up with, but sometimes it's just a little too accurate. *PCW* Associate Editor, Simon Rockman, was sent a special offer by Tektronix to try to persuade him to buy a Phaser 340. Included in the bumf was a "What the press say" quote, using a paragraph from the *PCW* review. And who originally wrote the review? None other than our Simon.

Non PC

A book called *The Computer Contradiction* landed in *PCW*'s office this month. It looked amusing at first glance — until we read the following entry: "macaroon n. A half-caste employed by Apple Computer Inc". And this from the MIT Press, of all people... Don't buy it.



...and hold the gherkin

You didn't ask for it but You Got It Anyway. Now you never need be more than a few centimetres away from a delicious cheeseburger, complete with ketchup and extra relish. But take care not to mistake this wacky McMicrosoft-compatible mouse for a real burger.



The three buttons are configurable, and the simulated sesame seeds don't fall off; and they've been ergonomically designed to make your fingers feel nice and tingly.

If you really want one of these cheesy devices, call Multimedia on 0171 833 9111. After all, it's only £27. McBargain...

While compiling our Accounting Software group test this month, we found that without the right software, some accountants just go to pot

Red face corner

● The *PCW* gremlins have been hard at work once more, producing the odd error in some of the phone numbers we printed in our December issue. Just to straighten things out, here is the correct info:

The phone number for Reflex Magnetics featured in *Newsprint*, page 18, is 0171 372 6666.

And we missed a digit in Kudos Thame's phone number given on page 21; the correct number is 01734 351010.

The phone number for J&S Software, which produces the Guinness Encyclopedia, is 01225 760743.

● The number gnomes also had a go at the price of Eurotalk's *Apprendre Le Francais avec Le Fils d'Asterix* CD-ROM. It's only £42, not £242 as printed.

● Contrary to the review in our September issue (page 202), all Mesh Pentium systems are supplied with Triton motherboards, pipeline burst-mode cache and EDO-RAM as standard. The correct phone number for Mesh is 0181 452 1111.